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Excel 2010 Advanced

Stephen Moffat

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Stephen Moffat, The Mouse Training Company

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Excel 2010 Advanced
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Introduction

Excel 2010 is a powerful spreadsheet application that allows users to produce tables containing calculations and graphs. These can range from simple formulae through to complex functions and mathematical models.

How To Use This Guide

This manual should be used as a point of reference after following attendance of the advanced level Excel 2010 training course. It covers all the topics taught and aims to act as a support aid for any tasks carried out by the user after the course.

The manual is divided into sections, each section covering an aspect of the advanced course. The table of contents lists the page numbers of each section and the table of figures indicates the pages containing tables and diagrams.

Objectives

Sections begin with a list of objectives each with its own check box so that you can mark off those topics that you are familiar with following the training.

Instructions

Those who have already used a spreadsheet before may not need to read explanations on what each command does, but would rather skip straight to the instructions to find out how to do it. Look out for the arrow icon which precedes a list of instructions.

Appendices

The Appendices list the Ribbons mentioned within the manual with a breakdown of their functions and tables of shortcut keys.

Keyboard

Keys are referred to throughout the manual in the following way:

[**ENTER**] – Denotes the return or enter key, [**DELETE**] – denotes the Delete key and so on.

Where a command requires two keys to be pressed, the manual displays this as follows:

[**CTRL**] + [**P**] – this means press the letter "p" while holding down the Control key.

Commands

When a command is referred to in the manual, the following distinctions have been made:

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When Ribbon commands are referred to, the manual will refer you to the Ribbon – E.g. "Choose **home** from the Ribbons the group name – **FONT** group and then **B** for bold**"**.

When dialog box options are referred to, the following style has been used for the text – "In the **PAGE RANGE** section of the **PRINT** dialog, click the **CURRENT PAGE** option"

Dialog box buttons are shaded and boxed – "Click **OK** to close the **PRINT** dialog and launch the print."

Notes

Within each section, any items that need further explanation or extra attention devoted to them are denoted by shading. For example:

"Excel will not let you close a file that you have not already saved changes to without prompting you to save."

Tips

At the end of each section there is a page for you to make notes on and a "Useful Information" heading where you will find tips and tricks relating to the topics described within the section.

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1 Advanced worksheet functions

By the end of this section you will be able to:

- Understand and use conditional formulae
- Set up **LOOKUP** tables and use **LOOKUP** functions
- Use the **GOAL SEEK**
- Use the **SOLVER**

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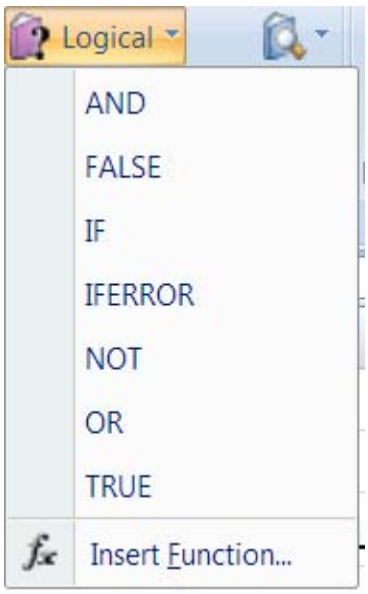
Conditional & Logical Functions

Excel has a number of logical functions which allow you to set various "conditions" and have data respond to them. For example, you may only want a certain calculation performed or piece of text displayed if certain conditions are met. The functions used to produce this type of analysis are found in the Insert, Function menu, under the heading LOGICAL.



If Statements

The IF function is used to analyse data, test whether or not it meets certain conditions and then act upon its decision. The formula can be entered either by typing it or by using the Function Library on the formula's ribbon, the section that deals with logical functions Typically, the IF statement is accompanied by three arguments enclosed in one set of parentheses; the condition to be met (logical_test); the action to be performed if that condition is true (value_if_true); the action to be performed if false (value_if_false). Each of these is separated by a comma, as shown;

=IF (logical_test, value_if_true, value_if_false)

To view IF function syntax:

Mouse

1. Click the drop down arrow next to the **LOGICAL** button in the **FUNCTION LIBARY** Groupon the **FORMULAS** Ribbon;
2. A dialog box will appear
3. The three arguments can be seen within the box

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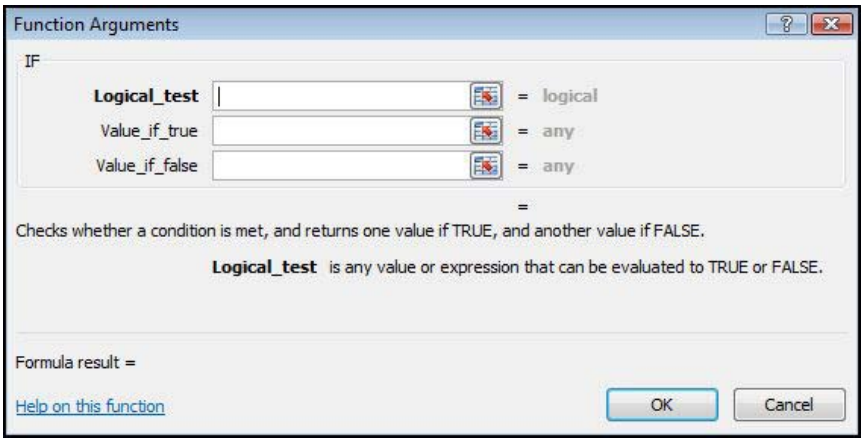

Logical Test

This part of the IF statement is the "condition", or test. You may want to test to see if a cell is a certain value, or to compare two cells. In these cases, symbols called **LOGICAL OPERATORS** are useful;

>	**Greater than**
<	**Less than**
> =	**Greater than or equal to**
< =	**Less than or equal to**
=	**Equal to**
<>	**Not equal to**

Therefore, a typical logical test might be **B1>B2,** testing whether or not the value contained in cell **B1** of the spreadsheet is greater than the value in cell B2. Names can also be included in the logical test, so if cells **B1** and **B2** were respectively named **SALES** and **TARGET**, the logical test would read **SALES>TARGET**. Another type of logical test could include text strings. If you want to check a cell to see if it contains text, that text string must be included in quotation marks. For example, cell **C5** could be tested for the word **YES** as follows; **C5**="**YES**".

It should be noted that Excel's logic is, at times, brutally precise. In the above example, the logical test is that sales should be greater than target. If sales are equal to target, the **IF** statement will return the false value. To make the logical test more flexible, it would be advisable to use the operator >= to indicate "meeting or exceeding".

Value If True / False

Provided that you remember that **TRUE** value always precedes **FALSE** value, these two values can be almost anything. If desired, a simple number could be returned, a calculation performed, or even a piece of text entered. Also, the type of data entered can vary depending on whether it is a true or false result. You may want a calculation if the logical test is true, but a message displayed if false. (Remember that text to be included in functions should be enclosed in quotes).

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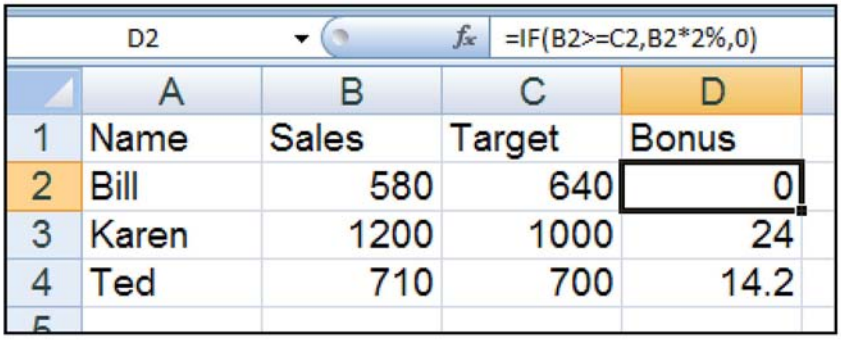
Taking the same logical test mentioned above, if the sales figure meets or exceeds the target, a **BONUS** is calculated (e.g. 2% of sales). If not, no bonus is calculated so a value of zero is returned. The **IF** statement in column D of the example reads as follows;

=IF(B2>=C2,B2*2%,0)



	A	B	C	D
1	Name	Sales	Target	Bonus
2	Bill	580	640	0
3	Karen	1200	1000	24
4	Ted	710	700	14.2

You may, alternatively, want to see a message saying "**NO BONUS**". In this case, the true value will remain the same and the false value will be the text string "**NO BONUS**";

=IF(B2>=C2,B2*2%,"NO BONUS")

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A particularly common use of **IF** statements is to produce "ratings" or "comments" on figures in a spreadsheet. For this, both the true and false values are text strings. For example, if a sales figure exceeds a certain amount, a rating of "**GOOD**" is returned, otherwise the rating is "**POOR**";

=IF(B2>1000,"GOOD","POOR")

Nested If

When you need to have more than one condition and more than two possible outcomes, a **NESTED IF** is required. This is based on the same principle as a normal **IF** statement, but involves "nesting" a secondary formula inside the main one. The secondary **IF** forms the FALSE part of the main statement, as follows;

=IF(1st logic test , 1st true value , IF(2nd logic test , 2nd true value , false value))

Only if both logic tests are found to be false will the false value be returned. Notice that there are two sets of parentheses, as there are two separate **IF** statements. This process can be enlarged to include more conditions and more eventualities - up to seven **IF**'s can be nested within the main statement. However, care must be taken to ensure that the correct number of parentheses are added.

In the example, sales staff could now receive one of three possible ratings;

=IF(B2>1000,"GOOD",IF(B2<600,"POOR","AVERAGE"))

To make the above **IF** statement more flexible, the logical tests could be amended to measure sales against cell references instead of figures. In the example, column E has been used to hold the upper and lower sales thresholds.

=IF(B2>$E$2,"GOOD",IF(B2<$E$3,"POOR","AVERAGE"))

(If the **IF** statement is to be copied later, this cell reference should be absolute).

D2 =IF(B2>1000,"good","poor")

	A	B	C	D
1	Name	Sales	Target	Bonus
2	Bill	580	640	poor
3	Karen	1200	1000	good
4	Ted	710	700	poor

N.B. The depth of nested IF functions has been increased to 64 as previous versions of excel only nested 7 deep

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Counting And Totalling Cells Conditionally

Occasionally you may need to create a total that only includes certain cells, or count only certain cells in a column or row.

	A	B	C	D	E	F
1	Order date	Customer	Product	Quantity	Price	Total
2	01/01/97	Viking Supplies	Widget	10	5	50
3	02/01/97	Bloggs & Co	Ratchet	23	7	161
4	02/01/97	Jones Brothers	Gimlet	200	3	600
5	03/01/97	Viking Supplies	Gimlet	201	3	603
6	01/01/97	Viking Supplies	Widget	296	5	1480
7	02/01/97	Bloggs & Co	Ratchet	371	7	2597
8	02/01/97	Jones Brothers	Gimlet	446	3	1338
9	03/01/97	Viking Supplies	Gimlet	521	3	1563
10	01/01/97	Viking Supplies	Widget	596	5	2980
11	02/01/97	Bloggs & Co	Ratchet	671	7	4697
12						
13	**Viking Supplies Total**					
14	**Bloggs & Co No. of orders**					

The example above shows a list of orders. There are two headings in bold at the bottom where you need to generate a) the total amount of money spent by Viking Supplies and b) the total number of orders placed by Bloggs & Co.

The only way you could do this is by using functions that have conditions built into them. A condition is simply a test that you can ask Excel to carry out the result of which will determine the result of the function.

Statistical If Statements

A very useful technique is to display text or perform calculations only if a cell is the maximum or minimum of a range. In this case the logical test will contain a nested statistical function (such as **MAX** or **MIN**). If, for example, a person's sales cell is the maximum in the sales column, a message stating "Top Performer" could appear next to his or her name. If the logical test is false, a blank message could appear by simply including an empty set of quotation marks. When typing the logical test, it should be understood that there are two types of cell referencing going on. The first is a reference to one person's figure, and is therefore relative. The second reference represents the **RANGE** of everyone's figures, and should therefore be absolute.

=IF(relative cell = MAX(absolute range) , "Top Performer" , "")

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B3 =IF(C3=MAX($C$2:$C$4),"Top Performer","")

	A	B	C	D	E
1	Name	Message	sales		
2	Bill		580		
3	Karen	Top Performer	1200		
4	Ted		710		

In this example the **IF** statement for cell **B2** will read;

=IF(C2=MAX($C$2:$C$4),"Top Performer","")

When this is filled down through cells **B3** and **B4**, the first reference to the individual's sales figure changes, but the reference to all three sales figures **($C$2:$C$4)** should remain constant. By doing this, you ensure that the **IF** statement is always checking to see if the individual's figure is the biggest out of the three.

A further possibility is to nest another **IF** statement to display a message if a value is the minimum of a range. Beware of syntax here - the formula could become quite unwieldy!

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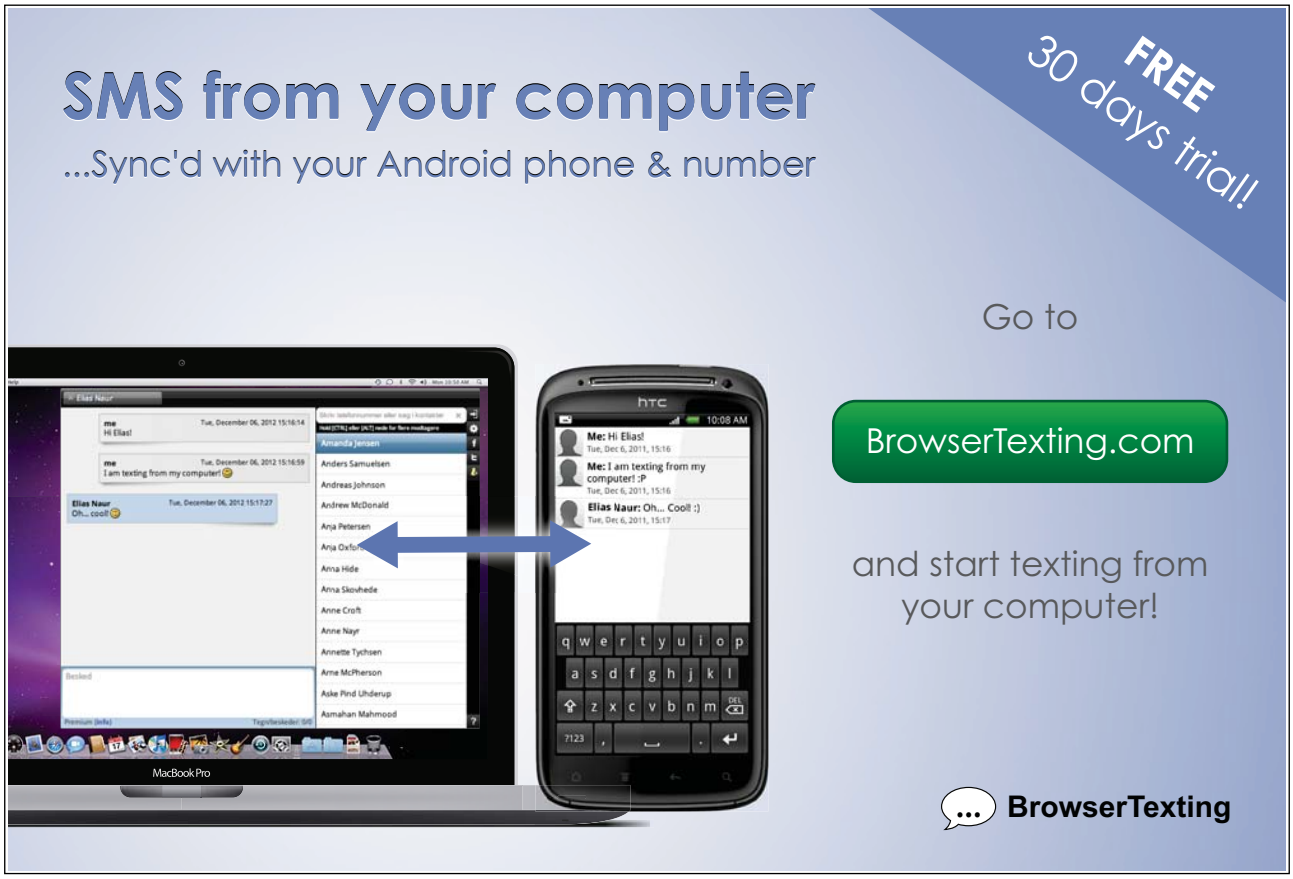

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Sumif

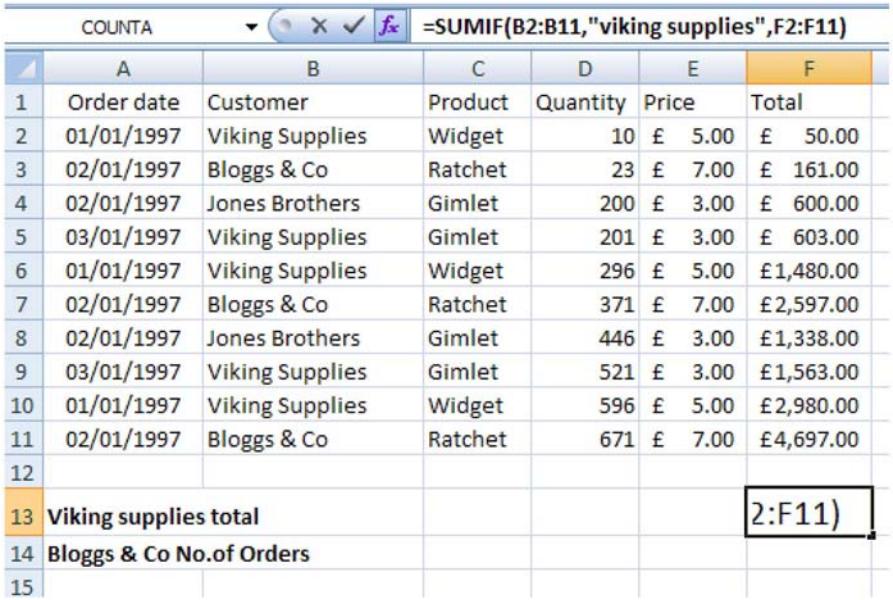
You can use this function to say to Excel, "Only total the numbers in the **Total** column where the entry in the **Customer** column is Viking Supplies". The syntax of the **SUMIF**() function is detailed below:

=SUMIF(range,criteria,sum_range)

RANGE is the range of cells you want to test.

CRITERIA. It is the criteria in the form of a number, expression, or text that defines which cells will be added. For example, criteria can be expressed as 32, "32", ">32", "apples".

SUM RANGE. These are the actual cells to sum. The cells in sum range are summed only if their corresponding cells in range match the criteria. If sum range is omitted, the cells in range are summed.



	A	B	C	D	E	F
1	Order date	Customer	Product	Quantity	Price	Total
2	01/01/1997	Viking Supplies	Widget	10	£ 5.00	£ 50.00
3	02/01/1997	Bloggs & Co	Ratchet	23	£ 7.00	£ 161.00
4	02/01/1997	Jones Brothers	Gimlet	200	£ 3.00	£ 600.00
5	03/01/1997	Viking Supplies	Gimlet	201	£ 3.00	£ 603.00
6	01/01/1997	Viking Supplies	Widget	296	£ 5.00	£1,480.00
7	02/01/1997	Bloggs & Co	Ratchet	371	£ 7.00	£2,597.00
8	02/01/1997	Jones Brothers	Gimlet	446	£ 3.00	£1,338.00
9	03/01/1997	Viking Supplies	Gimlet	521	£ 3.00	£1,563.00
10	01/01/1997	Viking Supplies	Widget	596	£ 5.00	£2,980.00
11	02/01/1997	Bloggs & Co	Ratchet	671	£ 7.00	£4,697.00
12						
13	**Viking supplies total**					2:F11)
14	**Bloggs & Co No.of Orders**					
15						

=SUMIF(B2:B11, "Viking Supplies", F2:F11)

With the example above, the **SUMIF** function that you would use to generate the **VIKING SUPPLIES TOTAL** would look as above.

Using the **INSERT FUNCTION** tool the dialog would look like this and show any errors in entering the values or ranges

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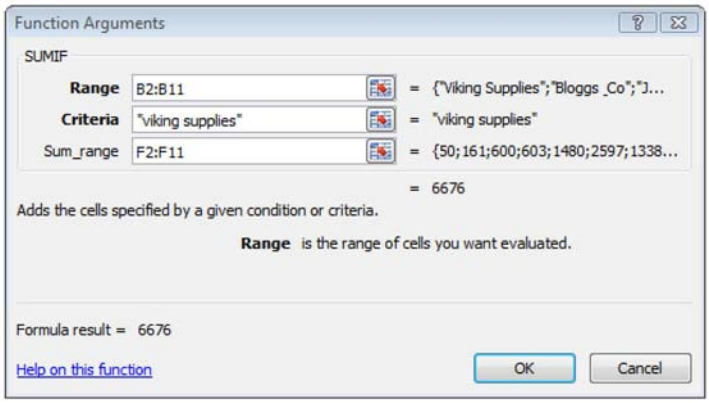
Function Arguments
SUMIF
Range B2:B11 = {"Viking Supplies";"Bloggs _Co";"J...
Criteria "viking supplies" = "viking supplies"
Sum_range F2:F11 = {50;161;600;603;1480;2597;1338...
= 6676
Adds the cells specified by a given condition or criteria.
Range is the range of cells you want evaluated.
Formula result = 6676
Help on this function
OK
Cancel

Countif

countif counts the number of cells in a range based on agiven criteria.

COUNTIF(range,criteria)

RANGEis one or more cells to count, including numbers or names, arrays, or references that contain numbers. Blank and text values are ignored.

CRITERIAIS the criteria in the form of a number, expression, cell reference, or text that defines which cells will be counted. For example, criteria can be expressed as 32, "32", ">32", "apples", or **B4**.

To use COUNTIF function

Mouse

1. Click on the **MORE FUNCTIONS** button in the **FORMULAS** group on the **FORMULAS** ribbon
2. Click on **STATISTICAL.**
3. Select **COUNTIF** from the displayed functions. A dialog will be displayed

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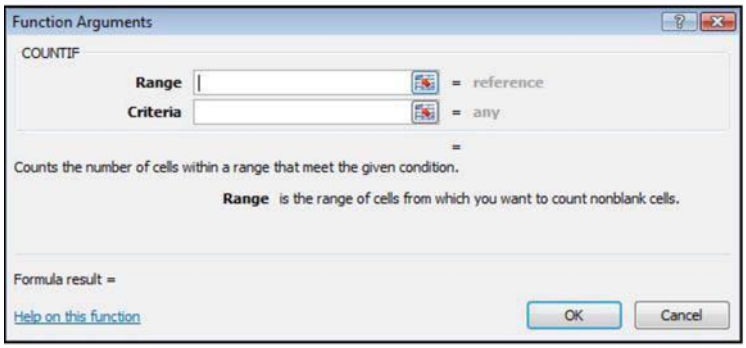

4. Click in **RANGE** text box
5. Select the range of cells you wish to check.
6. Click in the **CRITERIA** box, either, type criteria directly in the box or select a cell that contains the value you wish to count.
7. Click **OK**

Averageif

A very common request is for a single function to conditionally average a range of numbers – a complement to **SUMIF** and **COUNTIF**. **AVERAGEIF**, allows users to easily average a range based on a specific criteria.

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AVERAGEIF(Range, Criteria, [Average Range])

RANGEis one or more cells to average, including numbers or names, arrays, or references that contain numbers.

CRITERIAIS the criteria in the form of a number, expression, cell reference, or text that defines which cells are averaged. For example, criteria can be expressed as 32, "32", ">32", "apples", or **B4**.

AVERAGe_rangeis the actual set of cells to average. If omitted, **RANGE** is used.

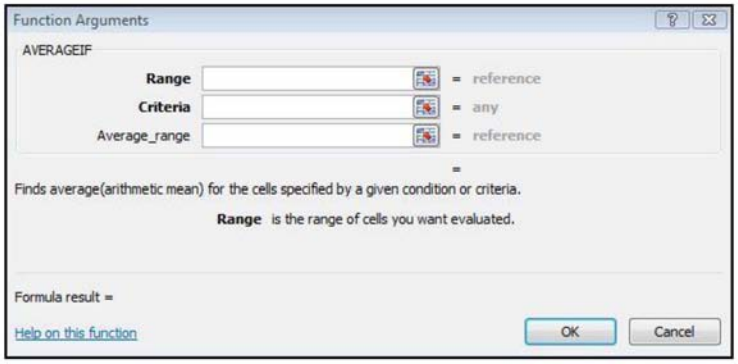
Here is an example that returns the average of **B2:B5** where the corresponding value in column A is greater than **250,000**:

=AVERAGEIF(A2:A5, ">250000", B2:B5)

To use AVERAGEIF function

Mouse

1. Click on the **MORE FUNCTIONS** button in the **FORMULAS** group on the **FORMULAS** ribbon and Click on **STATISTICAL.**
2. Select**AVERAGEIF** from the displayed functions. A dialog will be displayed



3. Click in **RANGE** text box.
4. Select the range of cells containing the .values you wish checked against the criteria.
5. Click in the **CRITERIA** box, either, type criteria directly in the box or select a cell that contains the value you wish to check the range against.
6. Click in the **AVERAGE_RANGE** text box and select the range you wish to average..
7. Click **ok.**

Averageifs

Average ifs is a new function to excel and does much the same as the **Averageif** function but it will average a range using multiple criteria.

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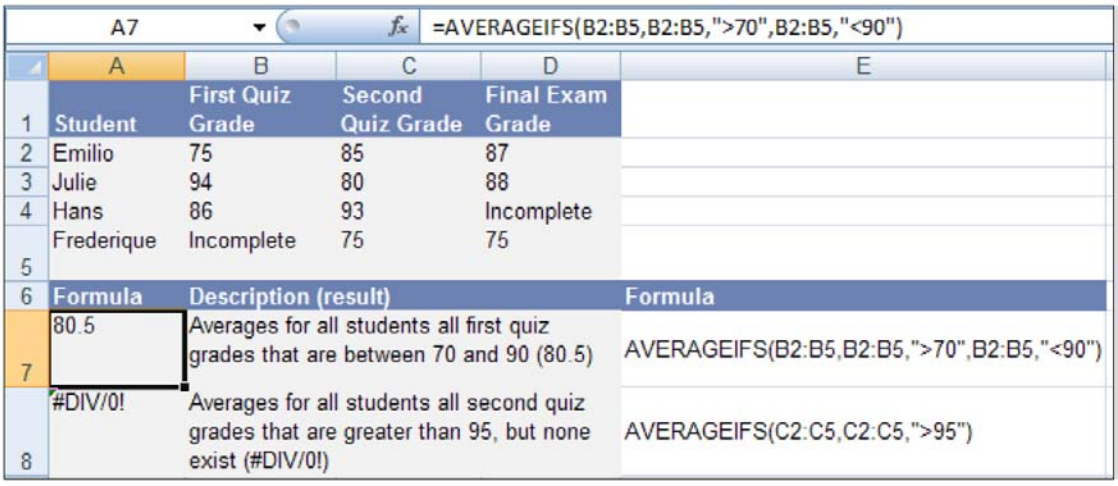
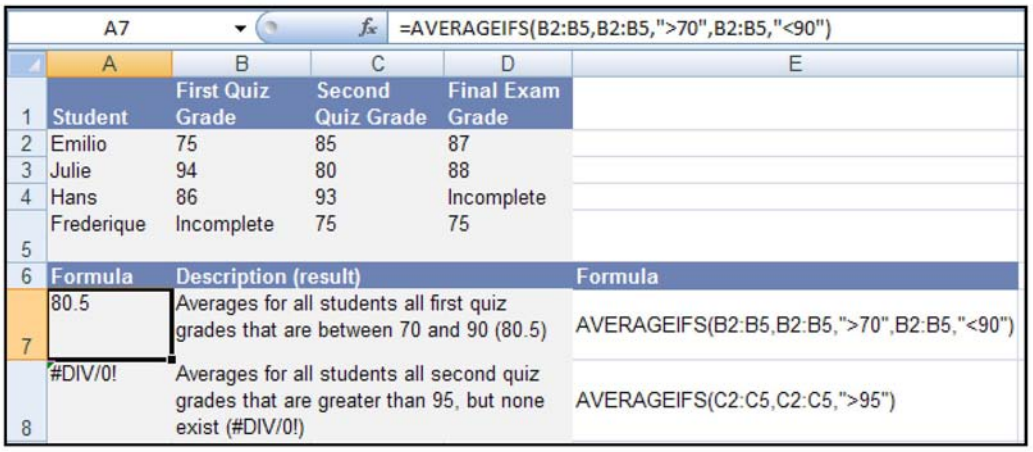


To use AVERAGEIFS function

Mouse

1. Click on the **MORE FUNCTIONS** button in the **FORMULAS** group on the **FORMULAS** ribbon and Click on **STATISTICAL.**
2. Select**AVERAGEIFS** from the displayed functions. A dialog will be displayed.



3. Click in **AVERAGE_RANGE** text box.
4. Select the range of cells containing the .values you wish checked against the criteria.
5. Click in the **CRITERIA_RANGE1** box select a range of cells that contains the values you wish to check the criteria against.
6. Click in the **CRITERIA1**Text box and type in the criteria to measure against your **CRITERIA_RANGE1.**
7. Repeat steps 5 and 6 to enter multiple criteria, range2, range3 etc, use the scroll bar on the right to scroll down and locate more range and criteria text boxes.Click **OK** when all ranges and criterias have been entered.

Some important points about AVERAGEIFS function

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- *If **AVERAGE_RANGE** is a blank or text value, **AVERAGEIFS** returns the **#DIV0!** error value.*
- *If a cell in a criteria range is empty, **AVERAGEIFS** treats it as a 0 value.*
- *Cells in range that contain **TRUE** evaluate as 1; cells in range that contain **FALSE** evaluate as 0 (zero).*
- *Each cell in **average_range** is used in the average calculation only if all of the corresponding criteria specified are true for that cell.*
- *Unlike the range and criteria arguments in the **AVERAGEIF** function, in **AVERAGEIFS** each **CRITERIA_RANGE** must be the same size and shape as sum_range.*
- *If cells in **AVERAGE_RANGE** cannot be translated into numbers, **AVERAGEIFS**returns the **#DIV0!** error value.*
- *If there are no cells that meet all the criteria, **AVERAGEIFS**returns the **#DIV/0!** error value.*
- *You can use the wildcard characters, question mark (?) and asterisk (*), in criteria. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.*

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Sumifs

This function adds all the cells in a range that meets multiple criteria.

The order of arguments is different between **SUMIFS** and **SUMIF**. In particular, the **SUM_RANGE** argument is the first argument in **SUMIFS**, but it is the third argument in **SUMIF**. If you are copying and editing these similar functions, make sure you put the arguments in the correct order.

SUMIFS(sum_range,criteria_range1,criteria1,criteria_range2,criteria2…)

- ***SUM_RANGE****is one or more cells to sum, including numbers or names, arrays, or references that contain numbers. Blank and text values are ignored.*
- ***CRITERIA_RANGE1, CRITERIA_RANGE2,****are 1 to 127 ranges in which to evaluate the associated criteria.*
- ***CRITERIA1, CRITERIA2, …****are 1 to 127 criteria in the form of a number, expression, cell reference, or text that define which cells will be added. For example, criteria can be expressed as 32, "32", ">32", "apples", or B4.*

Some important points about SUMIFS

- *Each cell in **SUM_RANGE** is summed only if all of the corresponding criteria specified are true for that cell.*
- *Cells in **SUM_RANGE** that contain **TRUE** evaluate as 1; cells in **SUM_RANGE** that contain **FALSE** evaluate as 0 (zero).*
- *Unlike the range and criteria arguments in the **SUMIF** function, in **SUMIFS** each **CRITERIA_RANGE** must be the same size and shape as **SUM_RANGE.***
- *You can use the wildcard characters, question mark (?) and asterisk (*), in criteria. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.*

To use SUMIFS function

Mouse

1. Click on the **MATH & TRIG BUTTON** in the **FORMULAS** group on the **FORMULAS** ribbon.
2. Select**SUMIFS** from the displayed functions. A dialog will be displayed.

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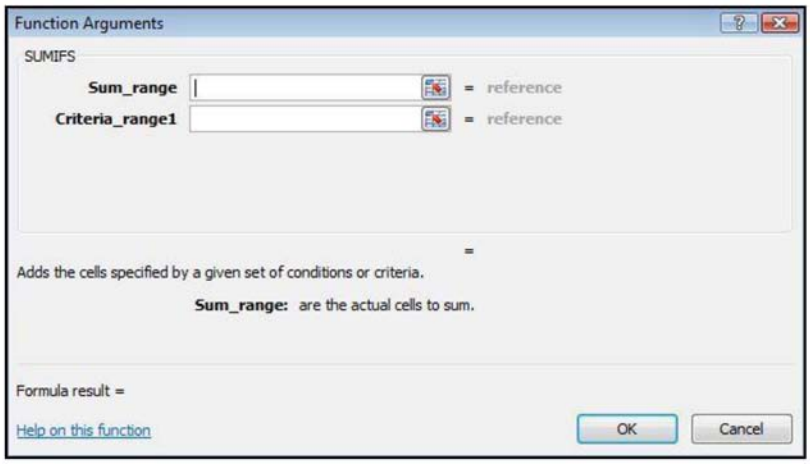

3. Click in **SUM_RANGE** text box.
4. Select the range of cells containing the .values you wish to sum up.
5. Click in the **CRITERIA_RANGE1** box select a range of cells that contains the values you wish to check the criteria against.
6. Click in the **CRITERIA1**Text box and type in the criteria to measure against your **CRITERIA_RANGE1.**
7. Repeat steps 5 and 6 to enter multiple criteria, range2, range3 etc, as you use each **CRITERIA_RANGE** and **CRITERIA** more text boxes will appear for you to use. Click **OK** When all ranges and criterias have been entered.

A7 =SUMIFS(B2:E2,B3:E3,">3%",B4:E4,">=2%")

	A	B	C	D	E	F	G	H	I	J	K
1	Totals	Account 1	Account 2	Account 3	Account 4						
2	Amount in dollars	100	390	8321	500						
3	Interest paid (2000)	1%	0.50%	3%	4%						
4	Interest paid (2001)	1%	1.30%	2.10%	2%						
5	Interest paid (2002)	0.50%	3%	1%	4%						
6	Formula	Description (result)				Formulas					
7	500	Total amounts from each bank account where the interest was greater than 3% for the year 2000 and greater than or equal to 2% for the year 2001 (500)				SUMIFS(B2:E2,B3:E3,">3%",B4:E4,">=2%")					
8	8711	Total amounts from each bank account where the interest was between 1% and 3% for the year 2002 and greater than 1% for the year 2001 (8711)				SUMIFS(B2:E2,B5:E5,">=1%",B5:E5,"<=3%",B4:E4,">1%")					

Countifs

The **COUNTIFS** function, counts a range based on multiple criteria.

COUNTIFS(range1, criteria1,range2, criteria2…)

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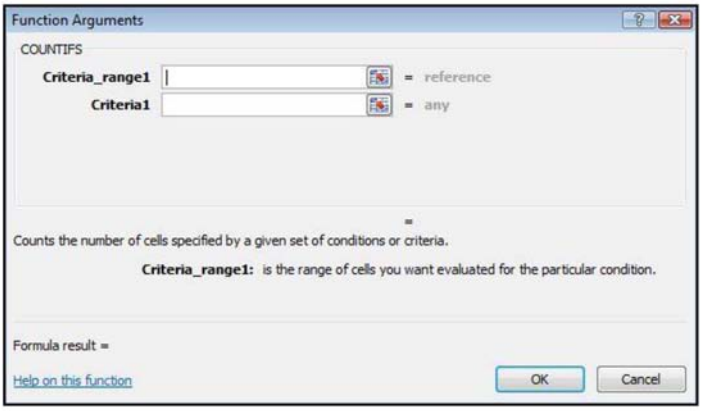
- ***RANGE1, RANGE2, …*** *are 1 to 127 ranges in which to evaluate the associated criteria. Cells in each range must be numbers or names, arrays, or references that contain numbers. Blank and text values are ignored.*
- ***CRITERIA1, CRITERIA2, …****are 1 to 127 criteria in the form of a number, expression, cell reference, or text that define which cells will be counted. For example, criteria can be expressed as 32, "32", ">32", "apples", or B4.*

To use COUNTIFS function

Mouse



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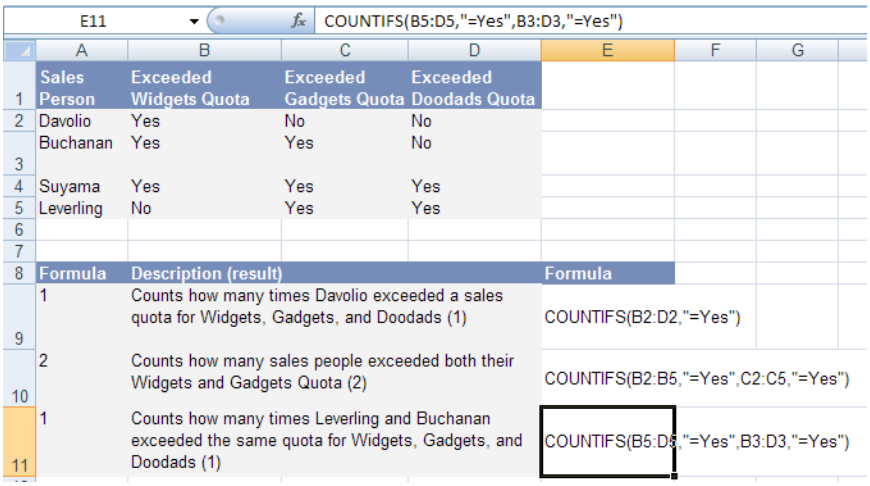
1. Click on the **MOREFUNCTIONS** button in the **FORMULAS** group on the **FORMULAS** ribbon and click on **STATISTICAL.**
2. Select**COUNTIFS** from the displayed functions. A dialog will be displayed.
3. Click in the **CRITERIA_RANGE1** box select the range of cells that you wish to count.
4. Click in the **CRITERIA1**Text box and type in the criteria to measure against your **CRITERIA_RANGE1.**
5. Repeat step 4 to enter multiple criteria, criteria_range2, range3 etc, as you use each **CRITERIA_RANGE** and **CRITERIA** more text boxes will appear for you to use. Click **OK**When all ranges and criterias have been entered.

   Each cell in a range is counted only if all of the corresponding criteria specified are true for that cell.



	A	B	C	D	E	F	G
1	Sales Person	Exceeded Widgets Quota	Exceeded Gadgets Quota	Exceeded Doodads Quota			
2	Davolio	Yes	No	No			
3	Buchanan	Yes	Yes	No			
4	Suyama	Yes	Yes	Yes			
5	Leverling	No	Yes	Yes			
6							
7							
8	Formula	Description (result)			Formula		
9	1	Counts how many times Davolio exceeded a sales quota for Widgets, Gadgets, and Doodads (1)			COUNTIFS(B2:D2,"=Yes")		
10	2	Counts how many sales people exceeded both their Widgets and Gadgets Quota (2)			COUNTIFS(B2:B5,"=Yes",C2:C5,"=Yes")		
11	1	Counts how many times Leverling and Buchanan exceeded the same quota for Widgets, Gadgets, and Doodads (1)			COUNTIFS(B5:D5,"=Yes",B3:D3,"=Yes")		

If criteria is an empty cell, **COUNTIFS** treats it as a 0 value.

You can use the wildcard characters, question mark (?) and asterisk (*), in criteria. A question mark matches any single character; an asterisk matches any sequence of characters. If you want to find an actual question mark or asterisk, type a tilde (~) before the character.

And, Or, Not

Rather than create large and unwieldy formulae involving multiple **IF** statements, the **AND**, **OR** and **NOT** functions can be used to group logical tests or "conditions" together. These three functions can be used on their own, but in that case they will only return the values "**TRUE**" or "**FALSE**". As these two values are not particularly meaningful on a spreadsheet, it is much more useful to combine the **AND**, **OR** and **NOT** functions within an **IF** statement. This way, you can ask for calculations to be performed or other text messages to appear as a result.

And

This function is a logical test to see if all conditions are true. If this is the case, the value "**TRUE**" is returned. If any of the arguments in the **AND** statement are found to be false, the whole statement produces the value "**FALSE**". This function is particularly useful as a check to make sure that all conditions you set are met.

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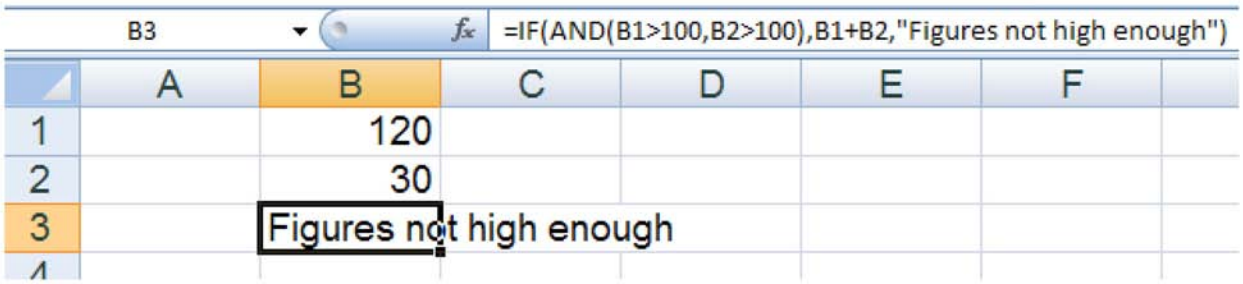
Arguments are entered in the **AND** statement in parentheses, separated by commas, and there is a maximum of 30 arguments to one **AND** statement. The following example checks that two cells, **B1** and **B2**, are both greater than 100.

=AND(B1>100,B2>100)

If either one of these two cells contains a value less than a hundred, the result of the **AND** statement is "**FALSE**." This can now be wrapped inside an **IF** function to produce a more meaningful result. You may want to add the two figures together if they are over 100, or display a message indicating that they are not high enough.

=IF(AND(B1>100,B2>100),B1+B2,"Figures not high enough")



Another application of **AND's** is to check that a number is between certain limits. The following example checks that a number is between **50** and **100**. If it is, the value is entered. If not, a message is displayed;

=IF(AND(B1>50,B1<100),B1,"Number is out of range")

Or

This function is a logical test to see if one or more conditions are true. If this is the case, the value "**TRUE**" is returned. If just one of the arguments in the **OR** statement is found to be true, the whole statement produces the value "**TRUE**". Only when all arguments are false will the value "**FALSE**" be returned. This function is particularly useful as a check to make sure that at least one of the conditions you set is met.

=IF(OR(B1>100,B2>100),"at least one is OK","Figures not high enough")

In the above formula, only one of the numbers in cells **B1** and **B2** has to be over 100 in order for them to be added together. The message only appears if neither figure is high enough.

Not

NOT checks to see if the argument is false. If so, the value "**TRUE**" is returned. It is best to use **NOT** as a "provided this is not the case" function. In other words, so long as the argument is false, the overall statement is true. In the example,

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the cell contents of **B1** are returned unless the number 13 is encountered. If **B1** is found to contain 13, the message "**Unlucky**!" is displayed;

=IF(NOT(B1=13),B1,"Unlucky!")

The **NOT** function can only contain one argument. If it is necessary to check that more than one argument is false, the **OR** function should be used and the true and false values of the IF statement reversed. Suppose, for example, a check is done against the numbers **13** and **666**;

=IF(OR(B1=13,B1=666),"Unlucky!",B1)

B3		=IF(OR(B1=13,B1=666),"Unlucky!",B1)				
	A	B	C	D	E	F
1		13				
2		99				
3		Unlucky!				
4						

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Iserror

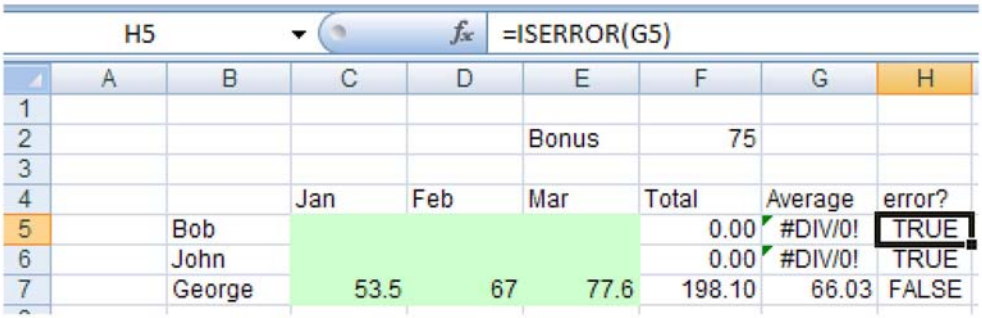
ISERROR is a very useful function that tells you if the formula you look at with it gives any error value.

Iserror(Value)

Value refers to any error value (#N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!)

To use ISERROR function

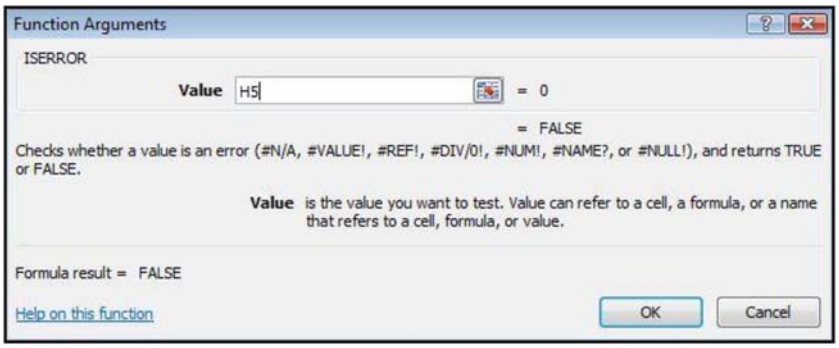
In the example below the average functions in the column G is trying to divide empty cells and giving the error message **#DIV/0!** The error function checking that cell gives the value true there is an error this could be nested in an **if** function with an **average** function so that the error message does not show in column G



	A	B	C	D	E	F	G	H
1								
2					Bonus	75		
3								
4			Jan	Feb	Mar	Total	Average	error?
5		Bob				0.00	#DIV/0!	TRUE
6		John				0.00	#DIV/0!	TRUE
7		George	53.5	67	77.6	198.10	66.03	FALSE

Mouse

1. Click on **MORE FUNCTIONS** in the **FORMULAS** group on the **FORMULAS** ribbon
2. Select **ISERROR** function


Function Arguments
ISERROR
Value H5
= 0
= FALSE
Checks whether a value is an error (#N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!), and returns TRUE or FALSE.
Value is the value you want to test. Value can refer to a cell, a formula, or a name that refers to a cell, formula, or value.
Formula result = FALSE
Help on this function
OK
Cancel

3. The dialog box above will appear
4. Select cell you wish to check, the cell reference will appear in the **VALUE** box.

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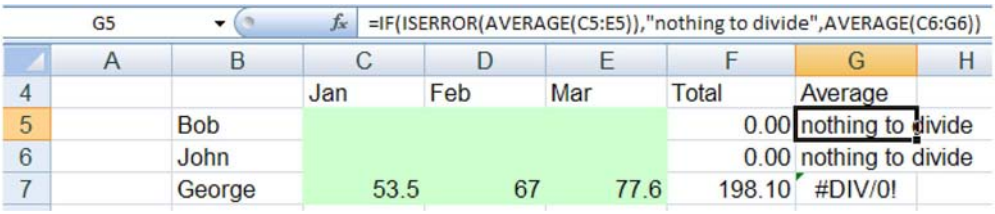
5. Click **OK**

   For more advanced users try nesting the **ISERROR** function and the function giving an error message in an **IF** function.


G5
=IF(ISERROR(AVERAGE(C5:E5)),"nothing to divide",AVERAGE(C6:G6))
A B C D E F G H
4 Jan Feb Mar Total Average
5 Bob 0.00 nothing to divide
6 John 0.00 nothing to divide
7 George 53.5 67 77.6 198.10 #DIV/0!

Iferror

IFERROR(Value, value_if_error)

A common request in the area of functions is something to simplify error checking.

E.G. If a user wants to catch errors in a **VLOOKUP** and use their own error text opposed to Excel's error, they have to do something like this using the **IF** and **ISERROR** functions:

> **=IF(ISERROR(VLOOKUP("Dave", SalesTable, 3, FALSE)), " Value not found", VLOOKUP("Dave", SalesTable, 3, FALSE))**

As you can see, users need to repeat the **VLOOKUP** formula twice. This has a number of problems.

- ***FIRST**, it is hard to read and hard to maintain – if you want to change a formula, you have to do it twice.*
- ***SECOND**, it can affect performance, because formulas are quite often run twice. The **IFERROR** function solves these problems, enabling customers to easily trap and handle formula errors.*

Here is an example of how a user could use it in the same situation:

=IFERROR(VLOOKUP("Bob", SalesTable, 3, false), "Value not found")

To use IFERROR function

Mouse

1. Click on **LOGICAL** in the **FORMULAS** group on the **FORMULAS** ribbon
2. Select **IFERROR** function

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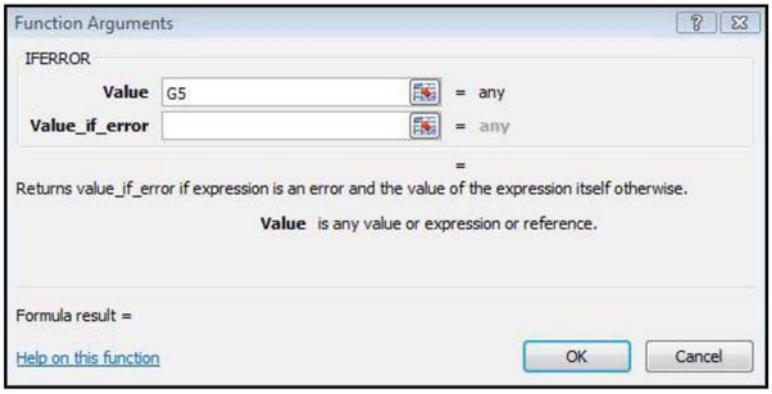

3. The dialog box above will appear
4. Click in the **VALUE** text box.
5. Select cell you wish to check, the cell reference will appear in the **VALUE** box.
6. Type in the **VALUE_IF_ERROR** text box what value you wish to display if an error is found
7. Click **OK**

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Lookup Functions

As already mentioned, Excel can produce varying results in a cell, depending on conditions set by you. For example, if numbers are above or below certain limits, different calculations will be performed and text messages displayed. The usual method for constructing this sort of analysis is using the **IF** function. However, as already demonstrated, this can become large and unwieldy when you want multiple conditions and many possible outcomes. To begin with, Excel can only nest seven IF clauses in a main **IF** statement, whereas you may want more than eight logical tests or "scenarios." To achieve this, Excel provides some **LOOKUP** functions. These functions allow you to create formulae which examine large amounts of data and find information which matches or approximates to certain conditions. They are simpler to construct than nested IF's and can produce many more varied results.

Lookup

Before you actually start to use the various **LOOKUP** functions, it is worth learning the terms that you will come across, what they mean and the syntax of the function arguments.

Vector Lookup

A vector is a series of data that only occupies one row or column. **LOOKUP** will look through this row or column to find a specific value. When the value is found, a corresponding "result" in the adjacent row or column is returned. For example, column **D** of a spreadsheet may contain figures, and the adjacent column **E** contains corresponding text. **LOOKUP** will search for the requested figure in column **D** and return the corresponding text from column **E**.

The syntax for **LOOKUP** is as follows;

=LOOKUP(lookup_value , lookup_vector , result_vector)

The **LOOKUP_VALUE** represents the number or text entry to look for; the **LOOKUP_VECTOR** is the area in which to search for the **LOOKUP_VALUE**; the **RESULT_VECTOR** is the adjacent row or column where the corresponding value or text is to be found.

It is essential that data in the lookup vector is placed in ascending order, i.e. numbers from lowest to highest, text from A to Z. If this is not done, the LOOKUP function may return the wrong result.

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B14 =LOOKUP(B13,D3:D11,E3:E11)

	A	B	C	D	E	F
1						
2	**What Car ?**				*Car*	
3				£10,000	Reliant	
4				£15,000	Metro	
5			*Salary*	£20,000	Golf	
6				£25,000	Sierra	
7				£30,000	Sapphire	
8				£33,000	Granada	
9				£35,000	Scorpio	
10				£40,000	Mercedes	
11				£50,000	Jaguar	
12						
13	Salary	40000				
14	Car	Mercedes				
15						

In the diagram, column **D** contains varying salaries, against which there is a company car in column **E** which corresponds to each salary. For example, a **£20,030** salary gets a **GOLF**, a **£35,000** salary gets a **SCORPIO**. A **LOOKUP** formula can be used to return whatever car is appropriate to a salary figure that is entered. In this case, the **LOOKUP_VALUe** is the cell where the salary is entered (**B13**), the **LOOKUP_VECTOR** is the salary column **(D3:D11)**, and the **RESULT_VECTOR** is the car column **(E3:E11)**. Hence the formula;

=LOOKUP(B13,D3:D11,E3:E11)

Typing **£40,000** in cell **B13** will set the **LOOKUP_VALUE**. **LOOKUP** will search through the **LOOKUP_VECTOR** to find the matching salary, and return the appropriate car from the **RESULT_VECTOR**, which in this case is **MERCEDES**.

Alternatively, the formula could be simplified and cell references avoided by using Formula, Define Name to give appropriate range names. Call **B13**Salary, **D3:D11**Salaries and **E3:E11**Cars. The **LOOKUP** formula could then be simplified to;

=LOOKUP(Salary,Salaries,Cars)

One of the advantages of the **LOOKUP** function is that if the exact LOOKUP_VALUE is not found, it will approximate to the nearest figure below the requested value. For instance, if a user enters a Salary of **23000**, there is no figure in the Salaries range which matches this. However, the nearest salary below **23000** is **20030**, so the corresponding car is returned, which is a **Golf**. This technique is very useful when the **LOOKUP_VECTOR** indicates grades or "bands." In this case, anyone in the salary "band" between **20030** and **25000** gets a **Golf**. Only when their salary meets or exceeds **25000** do they get a **SIERRA**.

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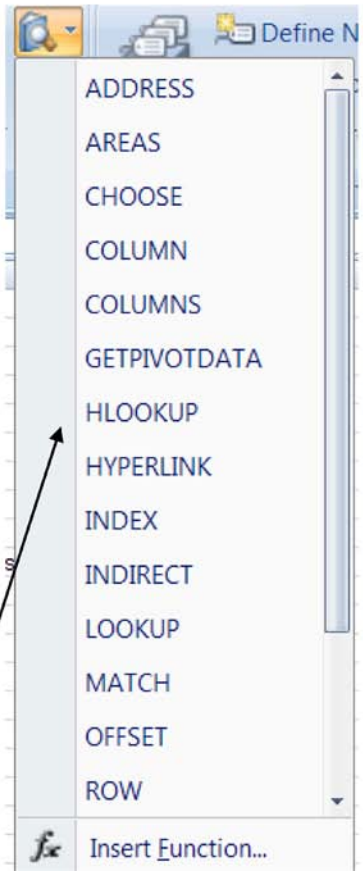
There may be occasions where the **LOOKUP_VALUE** is below the lowest value in the vector. In this case the **#N/A** message is displayed.

	A	B	C	D	Formula B
1					
2	What car ?				*Car*
3				£ 10,000	Reliant
4				£ 15,000	Metro
5			*Salary*	£ 20,000	Golf
6				£ 25,000	Sierra
7				£ 30,000	Sapphire
8				£ 35,000	Granada
9				£ 40,000	Scorpio
10				£ 45,000	Mercedes
11				£ 50,000	jaguar
12					
13	Salary	£23,000			
14	car	Golf			

Typical layout of a sheet needing a LOOKUP function



Location of all REFERENCE and LOOKUP functions

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To insert a lookup function:

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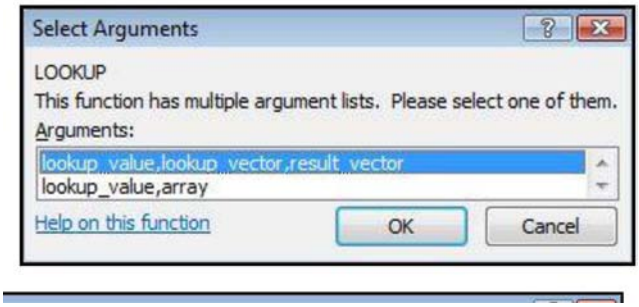
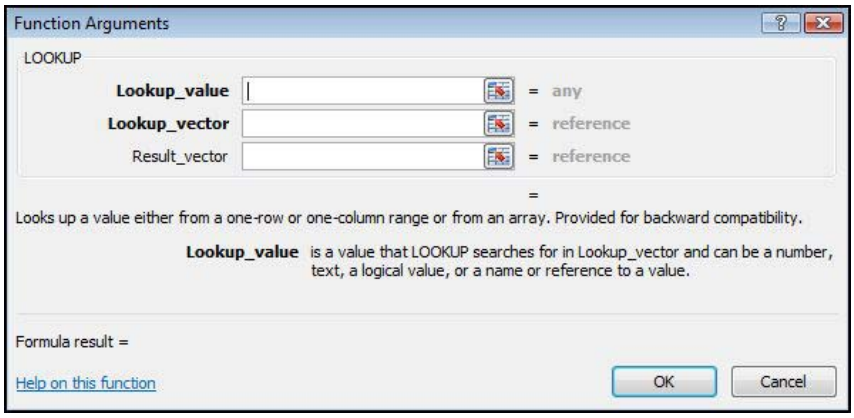


1. Click the drop down arrow next to the **LOOKUP AND REFENCe** button in the **FUNCTION LIBARY** groupon the**FORMULAS** Ribbon;


Function Arguments
LOOKUP
Lookup_value = any
Lookup_vector = reference
Result_vector = reference
=
Looks up a value either from a one-row or one-column range or from an array. Provided for backward compatibility.
Lookup_value is a value that LOOKUP searches for in Lookup_vector and can be a number, text, a logical value, or a name or reference to a value.
Formula result =
Help on this function
OK
Cancel

2. A dialog box appears displaying the two versions of **LOOKUP**. There are two syntax forms; the first is the "**VECTOR**" and the second the "**ARRAY**"
3. Choose vector and click **ok**
4. Enter the values as described previously and click **OK**
   The first of these forms, the "vector" LOOKUP is by far the most useful, and it is recommended that you only use this form.

Hlookup

The horizontal **LOOKUP** function (**HLOOKUP**) can be used not just on a "**VECTOR**" (single column or row of data), but on an "array" (multiple rows and columns). **HLOOKUP** searches for a specified value horizontally along the top row of an array. When the value is found, **HLOOKUP** searches down to a specified row and enters the value of the cell. This is useful when data is arranged in a large tabular format, and it would be difficult for you to read across columns and then down to the appropriate cell. **HLOOKUP** will do this automatically.

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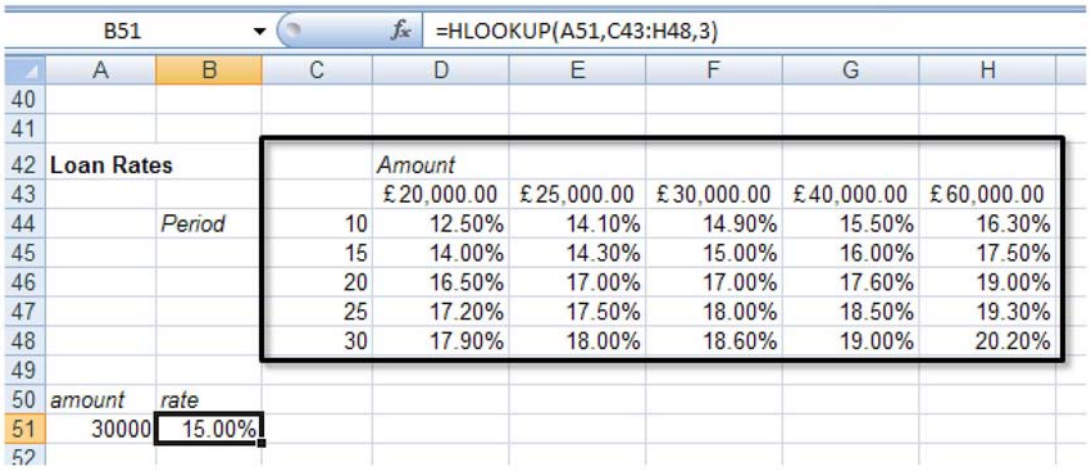
The syntax for HLOOKUP is;

=HLOOKUP(lookup_value , table_array , row_index_number)

The **LOOKUP_VALUE** is, as before, a number, text string or cell reference which is the value to be found along the top row of the data; the **TABLE_ARRAY** is the cell references (or range name) of the entire table of data; the **ROW_INDEX_NUMBER** represents the row from which the result is required. This must be a number, e.g. **4** instructs **HLOOKUP** to extract a value from row **4** of the **TABLE_ARRAY**.

It is important to remember that data in the array must be in ascending order. With a simple **LOOKUP** function, only one column or row of data, referred to as a vector, is required. **HLOOKUP** uses an array (i.e. more than one column or row of data). Therefore, as **HLOOKUP** searches horizontally (i.e. across the array), data in the first row must be in ascending order, i.e. numbers from lowest to highest, text from A to Z. As with **LOOKUP**, if this rule is ignored, **HLOOKUP** will return the wrong value.

As an example, a user may have a spreadsheet which displays various different rates of interest for a range of amounts over different time periods;



Whatever the amount a customer wants to borrow, he may pay up to five different rates of interest depending on whether the loan is over 10, 15 or more years. The **HLOOKUP** function will find a specific amount, then move down the array to find the appropriate interest rate for the required time period.

Designate cell **A51** as the cell to hold the amount, i.e. the **LOOKUP_VALUE**; cells **C43:H48** are the **TABLE_ARRAY**; the **ROW_INDEX_NUMBER** will be **2** if a customer wants the loan over 10 years, **3** if he wants the loan over 15 years, and so on. Cell **B51** holds this formula;

=HLOOKUP(A51,C43:H48,3)

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The above formula looks along the top row of the array for the value in cell **A51** (30000). It then moves down to row **3** and returns the value **15.00%**, which is the correct interest rate for a £30000 loan over 15 years. (Range names could be used here to simplify the formula).

As with the **LOOKUP** function, the advantage of **HLOOKUP** is that it does not necessarily have to find the exact **LOOKUP_VALUE**. If, for example, you wanted to find out what interest rate is applicable to a £28000 loan, the figure 28000 can be entered in the **LOOKUP_VALUE** cell (**A51**) and the rate 14.30% appears. As before, Excel has looked for the value in the array closest to, but lower than, the **LOOKUP_VALUE.**

Vlookup

The **VLOOKUP** function works on the same principle as **HLOOKUP**, but instead of searching horizontally, **VLOOKUP** searches vertically. **VLOOKUP** searches for a specified value vertically down the first column of an array. When the value is found, **VLOOKUP** searches across to a specified column and enters the value of the cell. The syntax for the **VLOOKUP** function follows the same pattern as **HLOOKUP**, except that instead of specifying a row index number, you would specify a column index number to instruct **VLOOKUP** to move across to a specific column in the array where the required value is to be found.

=VLOOKUP(lookup_value , table_array , col_index_number)

In the case of **VLOOKUP**, data in the first column of the array should be in ascending order, as **VLOOKUP** searches down this column for the **LOOKUP_VALUE**.

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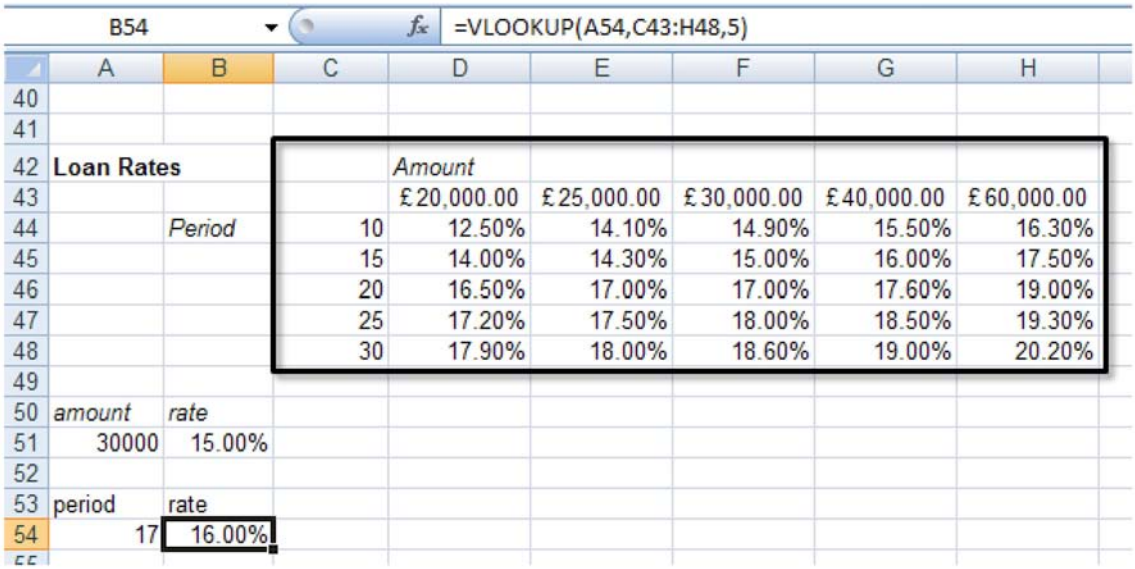
In the same spreadsheet, a **VLOOKUP** formula could be used to search for a specific time period, then return the appropriate rate for a fixed amount. In the following example, a time period is entered in cell **A54** and in **B54** the **VLOOKUP** formula is contained;



	A	B	C	D	E	F	G	H
40								
41								
42	**Loan Rates**			*Amount*				
43				£20,000.00	£25,000.00	£30,000.00	£40,000.00	£60,000.00
44		*Period*	10	12.50%	14.10%	14.90%	15.50%	16.30%
45			15	14.00%	14.30%	15.00%	16.00%	17.50%
46			20	16.50%	17.00%	17.00%	17.60%	19.00%
47			25	17.20%	17.50%	18.00%	18.50%	19.30%
48			30	17.90%	18.00%	18.60%	19.00%	20.20%
49								
50	*amount*	*rate*						
51	30000	15.00%						
52								
53	period	rate						
54	17	16.00%						

Cell **B54** holds this formula;

=VLOOKUP(A54,C43:H48,5)

The cell **A54** is the **LOOKUP_VALUE** (time period), the **TABLE_ARRAY** is as before, and for this example rates are looked up for a loan of £40000, hence the **COLUMN_INDEX_NUMBER5**. By changing the value of cell **A54**, the appropriate rate for that time period is returned. Where the specific lookup_value is not found, **VLOOKUP** works in the same way as **HLOOKUP**. In other words, the nearest value in the array that is less than the **LOOKUP_VALUE** will be returned. So, a £40000 loan over 17 years would return an interest rate of 16.00%.

Nested Lookups

One of the limitations of the horizontal and vertical **LOOKUP** functions is that for every **LOOKUP_VALUE** changed, the column or row index number stays constant. Using our example, the **HLOOKUP** will search for any amount, but always for the same time period. Conversely, the **VLOOKUP** will search for any time period, but always for the same amount. In both cases, if you want to alter the time period and the amount the formula must be edited to alter the column or row index number.

There is, however, a technique whereby one **LOOKUP** function is "nested" within another. This looks up one value, which will then be used in a second **LOOKUP** formula as a column or row index number. Using this technique allows you to, say, enter a time period and an amount and see the correct interest rate.

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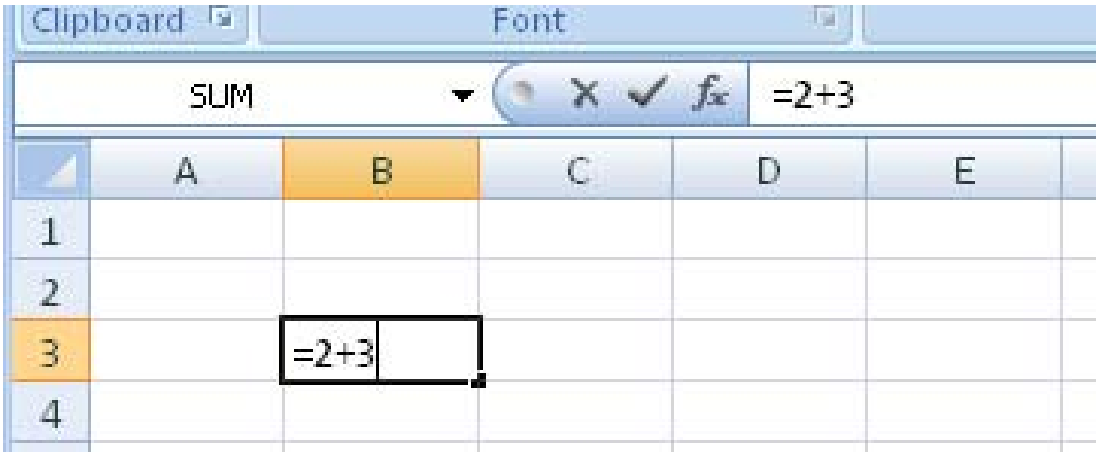
Because nested **LOOKUPs** have more than one **LOOKUP_VALUE**, more than one array is needed. This second array should consist of the column or row numbers to be used in the **LOOKUP** formula. The example shows our main interest rates spreadsheet, with an additional two columns of data;



COLUMN J contains all the same time periods as column C, but alongside this are numbers 2 to 6, indicating the **ROW_INDEX_NUMBER** to be returned for the appropriate time period. To look up this value, use a simple vector **LOOKUP** formula, where **K50** is the required time period, **J43:J47** is thE **LOOKUP_VECTOR** and **K43:K47** is the **RESULT_VECTOR**;

LOOKUP(K50,J43:J47,K43:K47)

Notice there is no equals sign, because this formula is not being entered in a cell of its own. The formula will return a value between 2 and 6 which will be used as a **ROW_INDEX_NUMBER** in a **HLOOKUP** formula. This **HLOOKUP** will look in the main interest rate table for an amount typed in by you, and will respond to thE **ROW_INDEX_NUMBER** returned from the nested **LOOKUP** formula. The cells **J50** and **K50** hold the amount and time period to be typed in by you, and the entire nested **HLOOKUP**, typed in **J52**, is as follows;

=HLOOKUP(J50,C43:H48,LOOKUP(K50,J43:J47,K43:K47))

In the example, the time period 25 is vertically looked up in **COLUMN J** and the corresponding value **5** is returned. Also, the amount 40000 is horizontally looked up in the main table, with a **ROW_INDEX_NUMBER** of **5**. The end result is an interest rate of 18.50%. Simply by changing cells **J50** and **K50**, the correct interest rate is always returned for the amount and period typed in.

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2 Views, scenarios, goal seek, solver

By the end of this section you will be able to:

- Create Views
- Use Goal seek and solver
- Switch between Views
- Create Scenarios
- Switch between Scenarios

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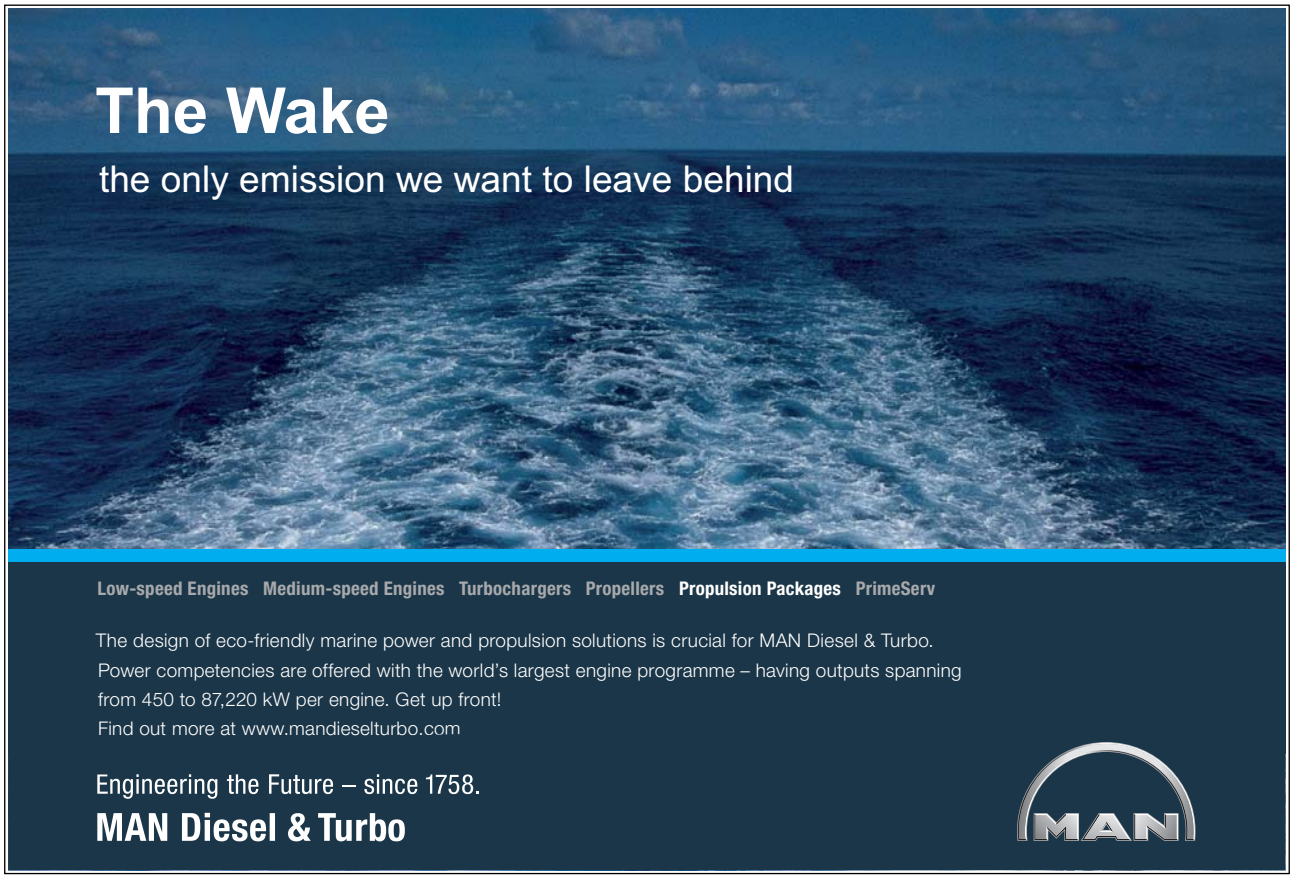
The Wake
the only emission we want to leave behind
Low-speed Engines Medium-speed Engines Turbochargers Propellers Propulsion Packages PrimeServ
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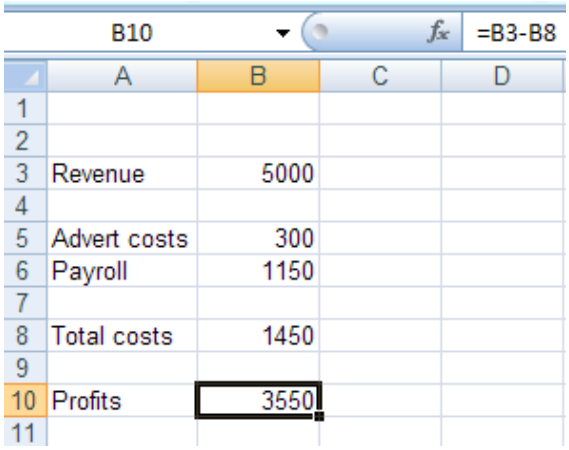
Goal Seeking And Solving

Excel has a number of ways of altering conditions on the spreadsheet and making formulae produce whatever result is requested. Excel can also forecast what conditions on the spreadsheet would be needed to optimise the result of a formula. For instance, there may be a profits figure that needs to be kept as high as possible, a costs figure that needs to be kept to a minimum, or a budget constraint that has to equal a certain figure exactly. Usually, these figures are formulae that depend on a great many other variables on the spreadsheet. Therefore, you would have to do an awful lot of trial-and-error analysis to obtain the desired result. Excel can, however, perform this analysis very quickly to obtain optimum results. The Goal Seek command can be used to make a formula achieve a certain value by altering just one variable. The Solver can be used for more painstaking analysis where many variables could be adjusted to reach a desired result. The Solver can be used to not only obtain a specific value, but also to maximise or minimise the result of a formula (e.g. maximise profits or minimise costs).



Goal Seek

The Goal Seek command is used to bring one formula to a specific value. It does this by changing one of the cells that is referenced by the formula. Goal Seek asks for a cell reference that contains a formula (the Set cell). It also asks for a value, which is the figure you want the cell to equal. Finally, Goal Seek asks for a cell to alter in order to take the Set cell to the required value.

In the example spreadsheet, cell **B8** contains a formula that sums advertising and payroll costs. Cell **B10** contains a profits formula based on the revenue figure, minus the total costs.

A user may want to see how a profit of 4000 can be achieved by altering payroll costs.

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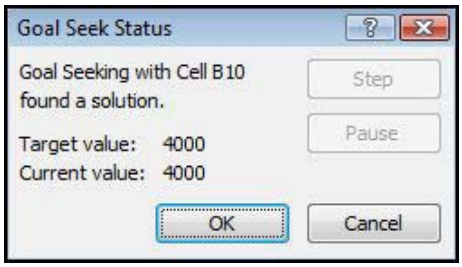
To launch the Goal seeker:

Mouse

1. On the **DATA** ribbon, **DATA TOOLS** group, click **WHAT-IF ANALYSIS** and then click **GOAL SEEK**.
2. In the **SET CELL** box, enter the reference for the cell that contains the formula result you wish to set to a specific figure. (In the example, this is cell **B10**.)



3. In the **TO VALUE** box, type the result you want. (In the example, this is -4000.)
4. In the **BY CHANGING CELL** box, enter the reference for the cell that contains the value you want to adjust. (In the example, this is cell **B3**.)
   The Goal Seek command automatically suggests the active cell as the Set cell. This can be overtyped with a new cell reference or you may click on the appropriate cell on the spreadsheet.

5. Click the **OK** button and the spreadsheet will alter the cell to a value sufficient for the formula to reach your goal. Goal Seek also informs you that the goal was achieved;
6. You now have the choice of accepting the revised spreadsheet, or returning to the previous values. Click **OK** to keep the changes, or **CANCEL** to restore previous values.

Goal Seek can be used repeatedly in this way to see how revenue or other costs could be used to influence the final profits. Simply repeat the above process and alter the changing cell reference.The changing cell must contain a value, not a formula. For example, if you tried to alter profits by changing total costs, this cell contains a formula and Goal Seek will not accept it as a changing cell. Only the advertising costs or the payroll cells can be used as changing cells.

Goal Seek will only accept one cell reference as the changing cell, but names are acceptable. For instance, if a user had named either cells B5 or B6 as "Advert_costs" or "Payroll" respectively, these names could be typed in the BY CHANGING CELL box. For goal-seeking with more than one changing cell, use the Solver.

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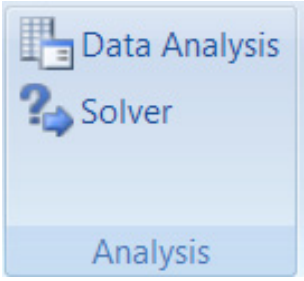

Solver

For more complex trial-and-error analysis the Excel Solver should be used. Unlike Goal Seek, the Solver can alter a formula not just to produce a set value, but also to maximise or minimise the result. Solver has changed markedly in 2010 from previous versions but works in very much the same way. More than one changing cell can be specified, so as to increase the number of possibilities, and constraints can be built in to restrict the analysis to operate only under specific conditions.

The basis for using the Solver is usually to alter many figures to produce the optimum result for a single formula. This could mean, for example, altering price figures to maximise profits. It could mean adjusting expenditure to minimise costs, etc. Whatever the case, the variable figures to be adjusted must have an influence, either, directly or indirectly, on the overall result, that is to say the changing cells must affect the formula to be optimised. Up to 200 changing cells can be included in the solving process, and up to 100 constraints can be built in to limit the Solver's results.

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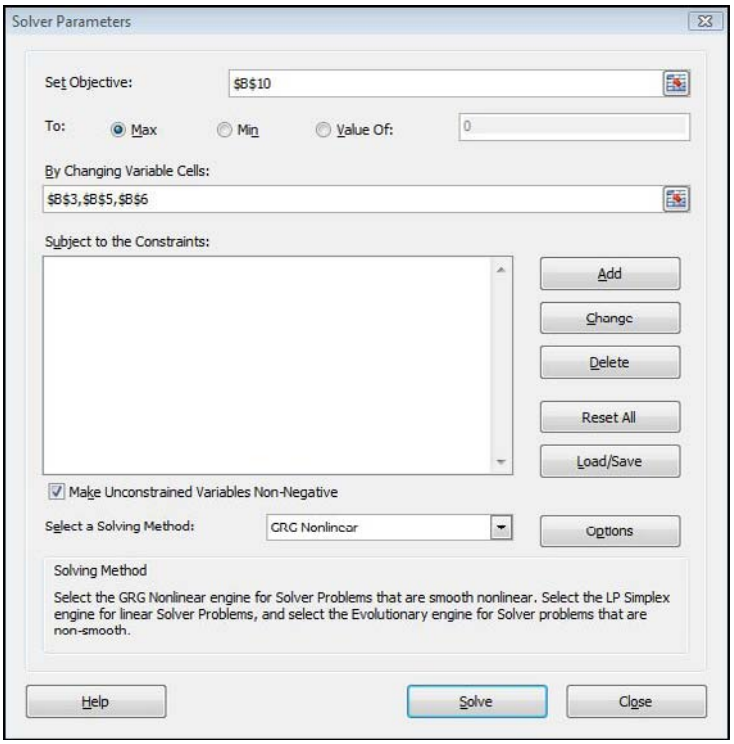

Solver Parameters

The Solver needs quite a lot of information in order for it to be able to come up with a realistic solution. These are the Solver parameters

To set up the Solver:

Mouse

1. Click the **SOLVER** buttonon the**DATA** Ribbon; in the **ANALYSIS** Group
2. If **SOLVER** is not visible it will be needed to be added into excel from the **EXCELOPTIONS** dialog in the **FILE** ribbon (go to **ADDINS** then choose **EXCEL ADDINS**)

   Like Goal Seek, the Set Cell is the cell containing the formula whose value is to be optimised. Unlike Goal Seek, however, the formula can be maximised or minimised as well as set to a specific value.

3. Decide which cells the Solver should alter in order to produce the Set Cell result. You can either type or click on the appropriate cells, and [**CTRL**] click if non-adjacent cell references are required.

When using a complex spreadsheet, or one that was created by someone else, there is an option to let the Solver guess the changing cells. Usually it will select the cells containing values that have an immediate effect on the Set Cell, so it may be a good idea to amend this.

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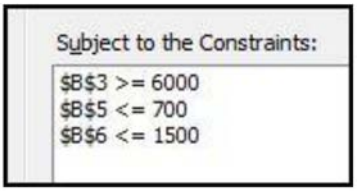
Constraints

Constraints prevent the Solver from coming up with unrealistic solutions.

To build constraints into your Solver parameters:

Mouse

1. In the **SOLVER** dialog, choose **ADD**
2. A dialog box appears and asks you to choose a cell whose value will be kept within certain limits. It can be any cell or cells on the spreadsheet (simply type the reference or select the range).
3. This cell can be subjected to an upper or lower limit, made to equal a specific value or forced to be a whole number. Drop down the arrow in the centre of the **ADD CONSTRAINT** box to see the list of choices:- To set an upper limit, click on the <= symbol; for a lower limit, >=; the = sign for a specific value and the **INT**option for an integer (whole number).



4. Once the **OK** button is chosen, the**SOLVER PARAMETERS** dialog box displays and the constraint appears in the window at the middle, left. These constraint can be amended using the **CHANGE** button, or removed using the **DELETE** button.

When maximising or minimising a formula value, it is important to include constraints which set upper or lower limits on the changing values. For instance, when maximising profits by changing sales figures, the Solver could conceivably increase sales to infinity. If the sales figures are not limited by an upper constraint, the Solver will return an error message stating that the cell values do not converge. Similarly, minimising total costs could be achieved by making one of the contributing costs infinitely less than zero. A constraint should be included, therefore, to set a minimum level on these values.

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	A	B	C	D	E	F	G	H	I
1									
2									
3		BARTS	CHAR X	HAMSMTH	MOORFIELDS	ST GEORGES			
4	Elective	4	5	5	4	7		25	
5	Emerg	3	2	4	5	3		17	
6	Day	9	8	7	10	6		40	
7		16	15	16	19	16		82	Total Cases
8									
9	Elective	11	9	13	2.4	6		41.4	
10	Emerg	8	8.2	10	5	4		35.2	
11	Day	3	6	14	3	2		28	
12		22	23.2	37	10.4	12		104.6	Total Cases
13									
14	Elective	44	45	65	9.6	42		205.6	
15	Emerg	24	16.4	40	25	12		117.4	
16	Day	27	48	98	30	12		215	
17		95	109.4	203	64.6	66		538	Total Cases

The example here shows the number of cases for five London hospitals, split into three types: **ELECTIVE**, **EMERGENCY** and **DAY** cases. Below this are the respective costs of each type of case for each hospital, and finally the total costs (number multiplied by price) for each type in each hospital. All these figures are totalled in column **H**, to arrive at a final total costs figure in cell **H17**.

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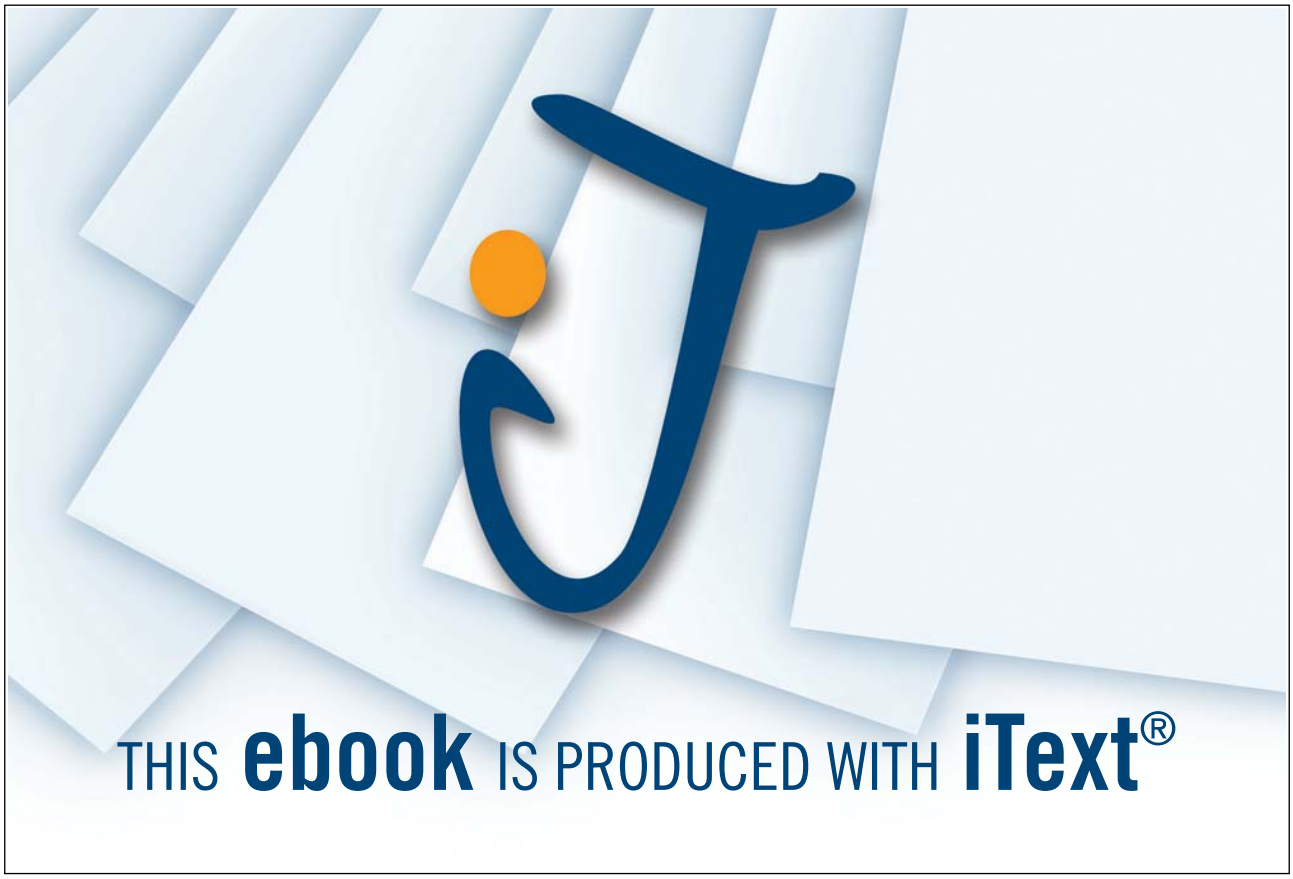

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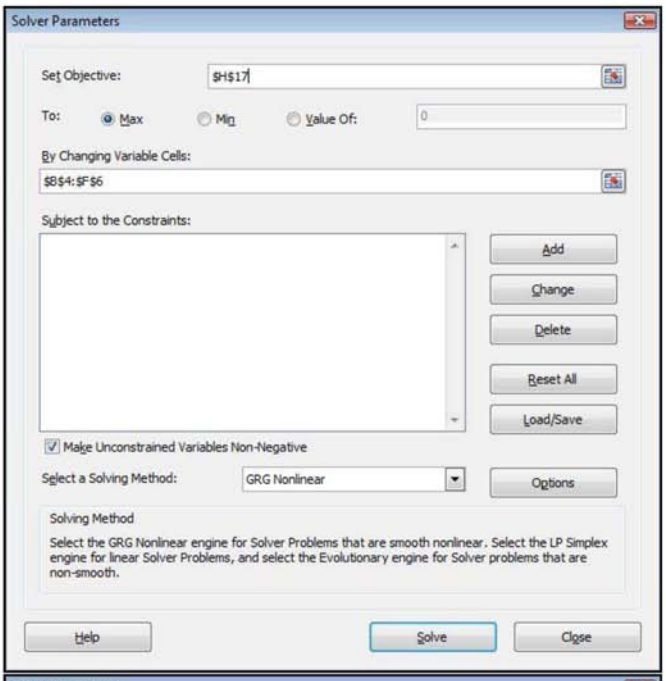

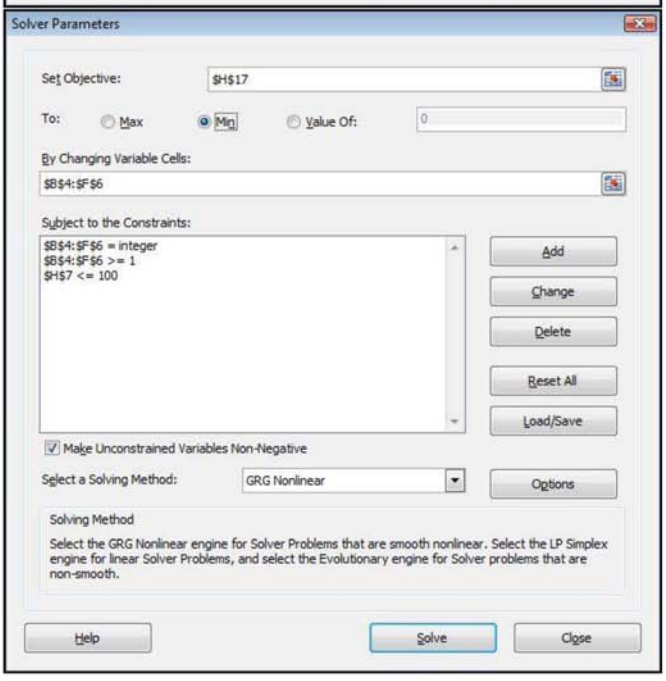

Call up **SOLVER** from the **ANALYSIS** group on the **DATA** ribbon. The Set Cell in this case will be **H17**, the total costs cell. It can be assumed that the costs of cases cannot be changed, only the number in each hospital, therefore the changing cells will be **B4:F6**:

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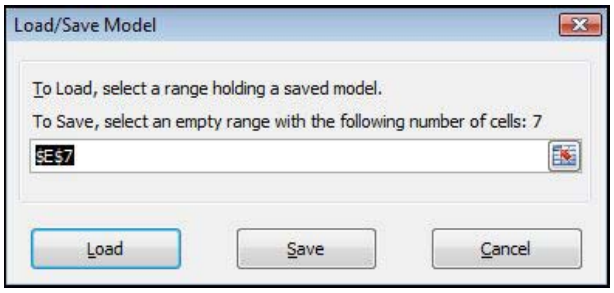
The problem is that, if Solve is chosen now, the number of cases could reduce to infinitely below zero and produce an error message. Fortunately, constraints can be built in to force each hospital to have a minimum number of cases, and for there to be a total number of cases overall. Choose the **ADD** option to add a constraint, highlight the cells **B4:F6**, drop down the arrow and click on >= to set a minimum limit. Here, type whatever the minimum number of cases should be. To avoid the error message, simply type **1** and choose **ADD**. Also, as hospital cases cannot be fractions, add another constraint to force these cells to be integers. Finally, a constraint could be added to set a total number of cases (cell **H7**). The Solver parameters should now appear as follows:

When Solve is chosen, the Solver carries out its analysis and finds a solution. This may be unsatisfactory, as it has calculated that the best way to minimise costs is to put the majority of cases in St George's as day patients. Further constraints could now be added to force the Solver to place minimum numbers of cases in the other hospitals, or set a maximum limit on St Georges' day cases.

Advanced Solver Features

Save Or Load A Problem Model

Mouse


Load/Save Model
To Load, select a range holding a saved model.
To Save, select an empty range with the following number of cells: 7
$E$5:7
Load
Save
Cancel

1. In the **SOLVER PARAMETERS** dialog box, click **LOAD/SAVE**.
2. Enter a cell range for the model area, and click either **SAVE** or **LOAD**.
3. When you save a model, enter the reference for the first cell of a vertical range of empty cells in which you want to place the problem model. When you load a model, enter the reference for the entire range of cells that contains the problem model.

Notes: You can save the last selections in the Solver Parameters dialog box with a worksheet by saving the workbook. Each worksheet in a workbook may have its own Solver selections, and all of them are saved. You can also define more than one problem for a worksheet by clicking Load/Save to save problems individually.

Solving Methods Used By Solver

You can choose any of the following three algorithms or solving methods in the Solver Parameters dialog box:

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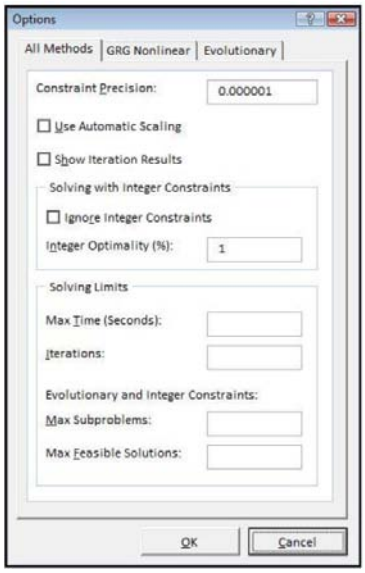
- ***GENERALIZED REDUCED GRADIENT (GRG) NONLINEAR*** *Use for problems that are smooth nonlinear.*
- ***LP SIMPLEX*** *Use for problems that are linear.*
- ***EVOLUTIONARY*** *Use for problems that are non-smooth.*

For more information about these methods, contact:

Frontline Systems, Inc.P.O. Box 4288 Incline Village, NV 89450-4288 (775) 831-0300 Web site: http://www.solver.com E-mail: info@solver.com



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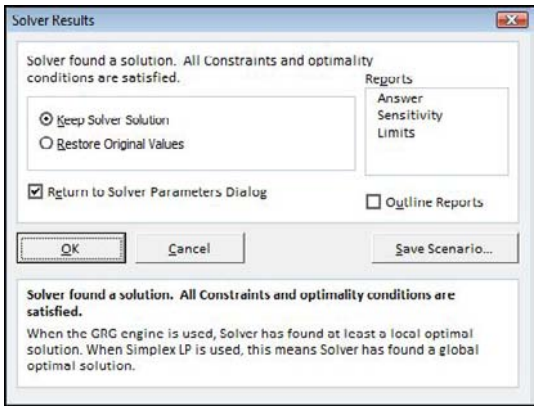
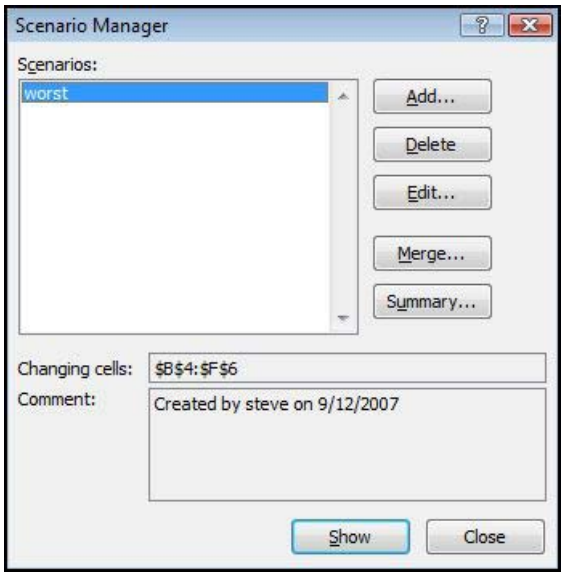
Solver Options

There are many options that you can access to refine your results for each of the solving methods mentioned above access these by clicking on the **OPTIONS** button on the **SOLVER PARAMETERS** dialog

Solver And Scenario Manager


Solver Results
Solver found a solution. All Constraints and optimality conditions are satisfied.
Reports
Answer
Sensitivity
Limits
Keep Solver Solution
Restore Original Values
Return to Solver Parameters Dialog
Outline Reports
OK
Cancel
Save Scenario...
Solver found a solution. All Constraints and optimality conditions are satisfied.
When the GRG engine is used, Solver has found at least a local optimal solution. When Simplex LP is used, this means Solver has found a global optimal solution.



The Solver uses sophisticated numeric analysis and iterative methods to perform trial-and-error calculations very quickly. The original values of the spreadsheet, therefore, have a profound effect on the result of a Solver solution. It may be the case that there is no concrete solution to a spreadsheet problem, and the Solver may produce a "best guess" within the specified constraints. Changing the original values and running the Solver again may produce a different result, and it may therefore by helpful to save the different "scenarios" that are produced. It may also be necessary to save scenarios where constraints have either been added, removed or amended. Using Excel's Scenario Manager can facilitate this, by allowing you to save each new Solver solution and compare it to previous ones. For most complex spreadsheet problems, the Solver and Scenario Manager are used together.

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Saving Solver Solutions

When the Solver finds a solution that seems feasible, you may want to save it.

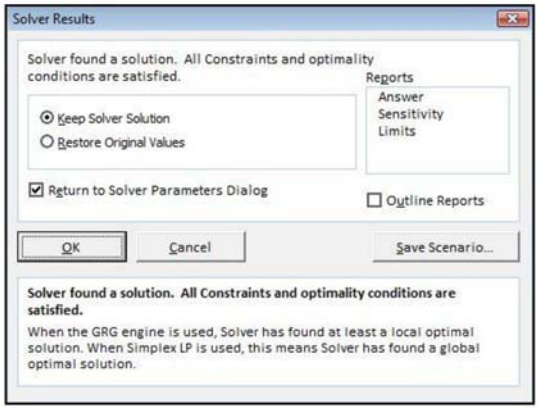
Save a solution as a Scenario:

Mouse

1. After clicking Solve you have a choice.
2. You have the choice of restoring the original values if you are not satisfied and wish to try another solver solution

3. Once Solver has found a solution, choose **SAVE SCENARIO** from the dialog box. The scenario can be named and either the new values kept or the original values restored.

Solver Reports


Solver Results
Solver found a solution. All Constraints and optimality conditions are satisfied.
Reports
Answer
Sensitivity
Limits
Keep Solver Solution
Restore Original Values
Return to Solver Parameters Dialog
Outline Reports
OK
Cancel
Save Scenario...
Solver found a solution. All Constraints and optimality conditions are satisfied.
When the GRG engine is used, Solver has found at least a local optimal solution. When Simplex LP is used, this means Solver has found a global optimal solution.

Once a Solver solution is obtained, a report can be generated to summarise the changes that have been made and how accurately the constraints have been satisfied. When changing cells have integer constraints, the only meaningful type of report is an **Answer Report,** which gives details of the target cell's original value and new value, the changes to the

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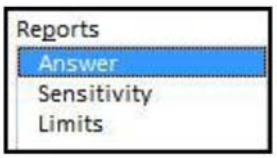
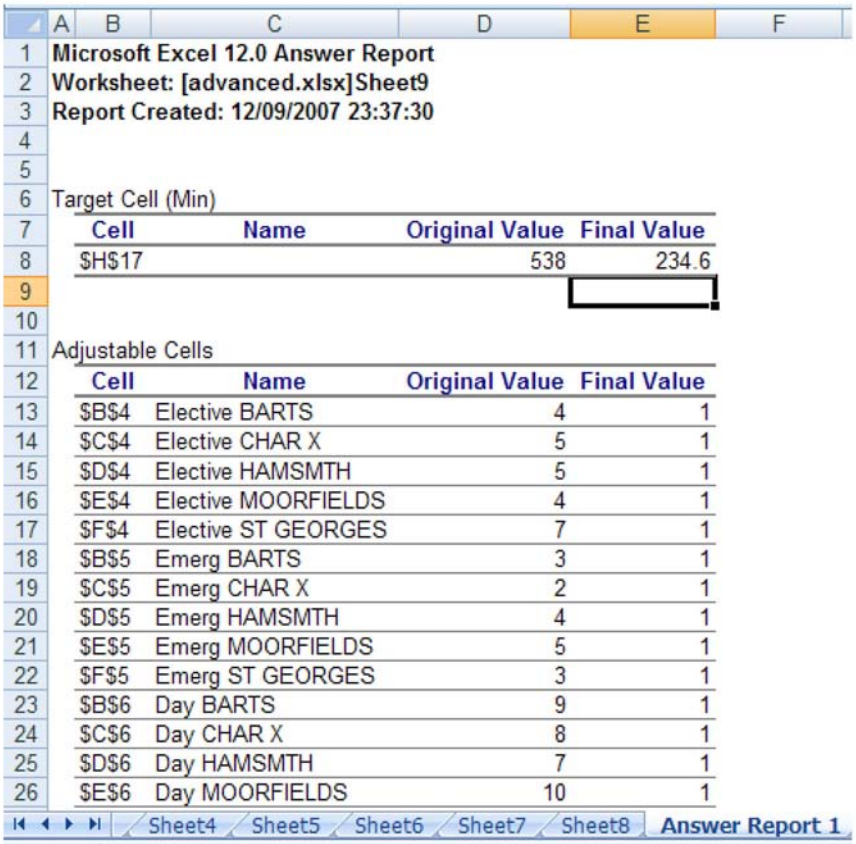
adjustable cells as well as all constraints.

To create a solver report:

Mouse



1. Click **ANSWER REPORT** from the **SOLVER RESULTS** dialog box.
2. Click **OK** - Excel generates the report in a new sheet behind the current worksheet.
3. To see the report, choose the **ANSWER REPORT**tab: behind current worksheet



	A	B	C	D	E	F
1	**Microsoft Excel 12.0 Answer Report**					
2	**Worksheet: [advanced.xlsx]Sheet9**					
3	**Report Created: 12/09/2007 23:37:30**					
4						
5						
6	Target Cell (Min)					
7		**Cell**	**Name**	**Original Value**	**Final Value**	
8		$H$17		538	234.6	
9						
10						
11	Adjustable Cells					
12		**Cell**	**Name**	**Original Value**	**Final Value**	
13		$B$4	Elective BARTS	4	1	
14		$C$4	Elective CHAR X	5	1	
15		$D$4	Elective HAMSMTH	5	1	
16		$E$4	Elective MOORFIELDS	4	1	
17		$F$4	Elective ST GEORGES	7	1	
18		$B$5	Emerg BARTS	3	1	
19		$C$5	Emerg CHAR X	2	1	
20		$D$5	Emerg HAMSMTH	4	1	
21		$E$5	Emerg MOORFIELDS	5	1	
22		$F$5	Emerg ST GEORGES	3	1	
23		$B$6	Day BARTS	9	1	
24		$C$6	Day CHAR X	8	1	
25		$D$6	Day HAMSMTH	7	1	
26		$E$6	Day MOORFIELDS	10	1	

Sheet4 Sheet5 Sheet6 Sheet7 Sheet8 **Answer Report 1**

Scenarios

To open scenario manager

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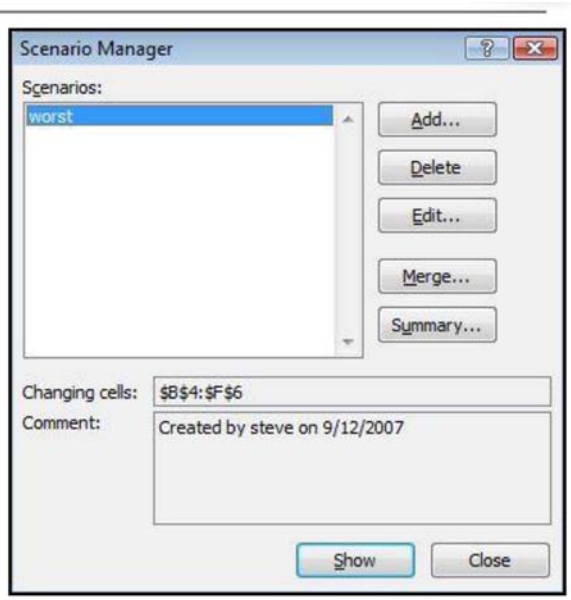
Mouse



1. Click **SCENARIO MANAGER** On the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon;
2. **SCENARIO MANAGER** will appear.

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To view a saved Scenario:

Mouse

1. Open **SCENARIO MANAGER**
2. **SCENARIO MANAGER** will appear. All named scenarios will be listed.
3. Click on the appropriate name and choose **SHOW** to display the results. Typically, a scenario only holds the results of the changing cells set in any **SOLVER PARAMETERS**. Choosing **Edit** from the **SCENARIO MANAGER** allows these values to be changed, or the Scenario renamed.

Create A Scenario Manually

Although solver can be used to create scenarios they can be manually created as well here we will create a simple group of scenarios to see how they may be used to store several sets of results.

The purpose of the Scenario Manager is to allow you to save a number of alternative inputs for specific cells which affect the results in a worksheet. For example, you may want to see the results of changes in costs figures, and their impact on profits. A variety of different costs figures could be saved as different "scenarios," and each one loaded in turn to produce comparisons.

Open The Scenario Manager

Once you have constructed your worksheet with the appropriate data and formulae, you are ready to set up scenarios.

To set up scenarios:

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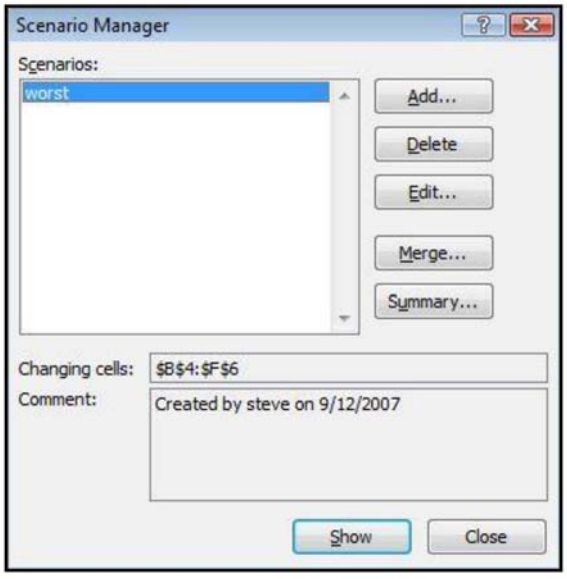

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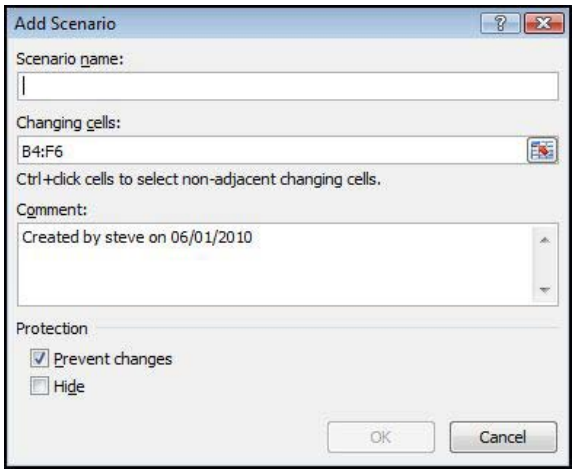
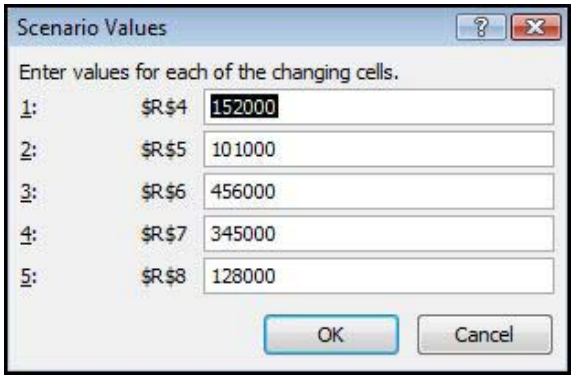
1. Click **SCENARIO MANAGER** on the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon.
2. Click the **ADD** button to name your scenario and define the **CHANGING CELLS** (the cells containing the values you want to vary for each scenario). The following dialog will appear:
3. Type a name in the box marked **SCENARIO NAME**.



4. Click the button to the right of the **CHANGING CELLS** box to collapse the dialog allowing you to view the worksheet and select the cells containing the variables. Non consecutive cells may be selected using [**CTRL**] and click. Click the **EXPAND**button to expand the Add Scenario dialog once more.
5. Click **OK** to add the Scenario. The **SCENARIO VALUES** dialog box will appear:



6. Type the value for the first changing cell that you want to save under the current scenario name. Press [**TAB**] to move to the next changing cell and type a value for that changing cell. Repeat the process until all changing cell values have been set for the current scenario.
7. Click the **OK** button to return to the **SCENARIO MANAGER** dialog
8. Click **CLOSE** to exit the Scenario Manager.

   Or

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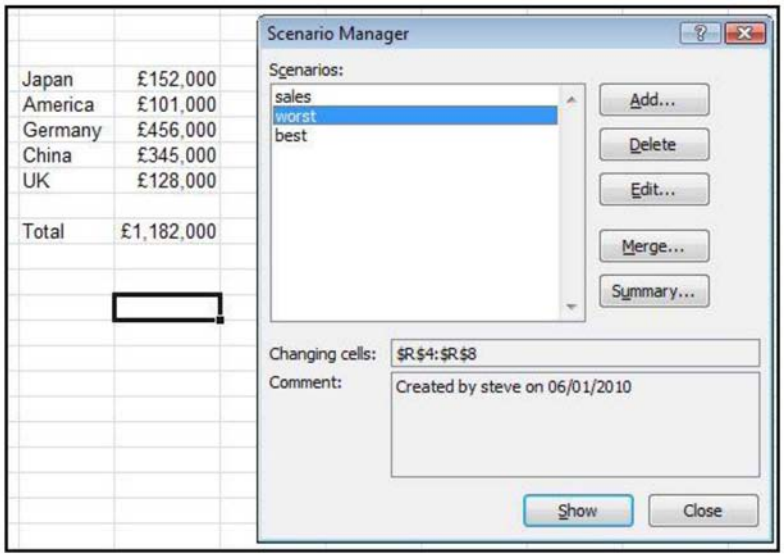
1. Click the **Add** button to define another scenario.
2. When all scenarios have been added, click **OK** to return to the **SCENARIO MANAGER** dialog and **CLOSE** to exit the Scenario Manager

Showing A Scenario

When several scenarios have been created, each one in turn can be shown. The values associated with that scenario will appear in the designated Changing Cells, and all the dependant formulae on the worksheet will update. Any charts dependant on the changing values will also update. The Scenario Manager dialog box will remain on screen, allowing you to click on an alternative scenario name and show it instead.

To show scenarios:

Mouse



1. Click **SCENARIO MANAGER** On the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon.
2. Double-click the scenario name whose values you want on the worksheet. Or select the scenario and click **SHOW** The values will appear in the changing cells.
3. The dialog box remains on-screen allowing you to double-click other scenario names and see how the changing values affect the data.
4. Click **CLOSE** to exit the **SCENARIO MANAGER** dialog.

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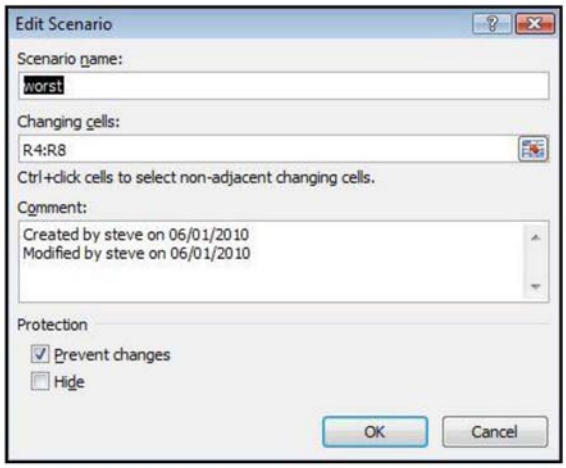
Editing A Scenario

There are two main ways in which you might wish to change an existing scenario. You might want to amend the values of the changing cells, or add or delete changing cells. The approach is slightly different for each of these tasks.

To change values in a scenario

Mouse



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1. Click **SCENARIO MANAGER** On the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon thE**DATA** Ribbon;
2. Select the name of the scenario to be edited.
3. Click on the **EDIT** button and click **OK**to close the **EDIT SCENARIO** dialog and open the **SCENARIO VALUES** dialog
4. Change the values as required, and click on the **OK** button. This procedure can be repeated if necessary to edit other scenarios.

To add changing cells:

Mouse

1. Click **SCENARIO MANAGER** On the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon; (
2. Select the name of the scenario to be edited.
3. Click on the **EDIT** button and click the button to the right of the **CHANGING CELLS** box to collapse the **EDIT SCENARIO** dialog.
4. Hold down the [**CTRL**] key as you click and drag across the cells that you want to add. Click the button to expand the dialog. Click **OK** to confirm the addition.
5. Enter the value for the newly added changing cell in the **SCENARIO VALUES** dialog and click **OK** to confirm.
6. Click **CLOSE** to exit the Scenario Manager.

To remove changing cells:

Mouse

1. Click **SCENARIO MANAGER** On the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon;
2. Select the name of the scenario to be edited.
3. Click on the **EDIT** button.
4. Drag across the cell references of the cells you want to remove from the **CHANGING CELLS** box and press [**DELETE**]. Click **OK** to confirm the deletion and **OK** again to close the **SCENARIO VALUES** dialog.
5. Click **CLOSE** to exit the Scenario Manager.

Deleting A Scenario

To delete a scenario:

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Mouse

1. Click **SCENARIO MANAGER** on the **WHAT IF ANALYSIS** button on the in the **DATA TOOLS** groupon the**DATA** Ribbon;
2. Select the name of the scenario to be deleted.

- *There will be no prompt to confirm deletion when deleting a scenario so ensure you have the correct scenario selected.*
- *Take note you can't undo the deletion of a scenario.*

3. Click **DELETE** button. The scenario is removed

Scenario Summary

To allow you to see the results and values all in one sheet for comparison or graphical purposes you may use the scenario summary tool to transpose all the result cells and changing values in an easy to see table.

To use scenario summary

Mouse

1. Open **SCENARIO MANAGER.**
2. Click on the **SUMMARY** button.
3. Choose scenario summary
4. The result cell or cells should be already in the **RESULT CELLS** box if you wish the **SCENARIO SUMMARY** to only show for a specific cell then change which result cell or cells you wish to display in the summary.
5. Click **OK** to view the summary
6. Please note that the summary is grouped to enable you to collapse and view just the results if you wish.

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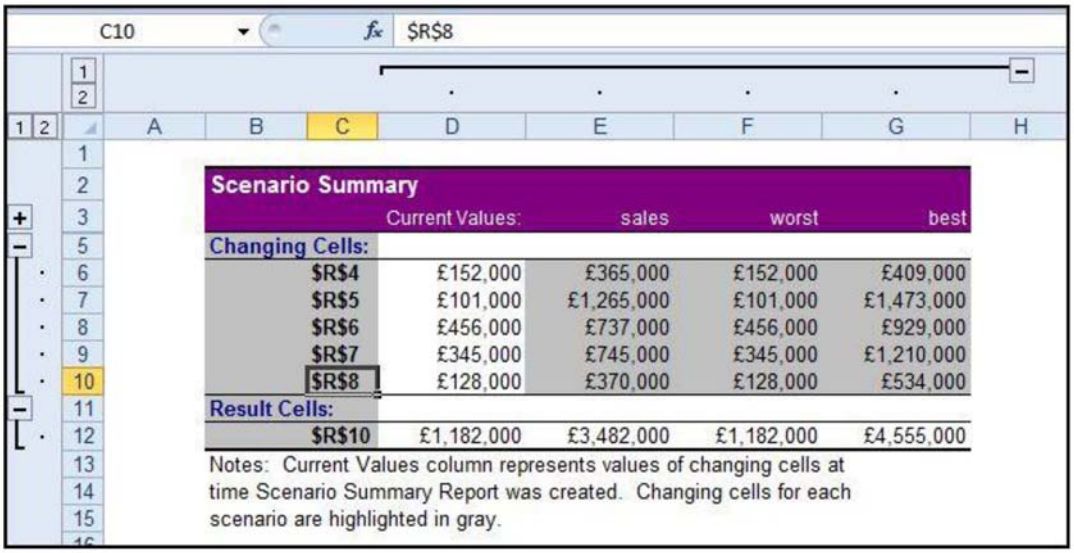

C10 $R$8

Scenario Summary	Current Values:	sales	worst	best
Changing Cells:				
$R$4	£152,000	£365,000	£152,000	£409,000
$R$5	£101,000	£1,265,000	£101,000	£1,473,000
$R$6	£456,000	£737,000	£456,000	£929,000
$R$7	£345,000	£745,000	£345,000	£1,210,000
$R$8	£128,000	£370,000	£128,000	£534,000
Result Cells:				
$R$10	£1,182,000	£3,482,000	£1,182,000	£4,555,000

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

Views

Excel's Custom Views are used to save and recall different display settings and print options. The Scenario Manager allows you to store changes to spreadsheet data and perform "what if" analysis.

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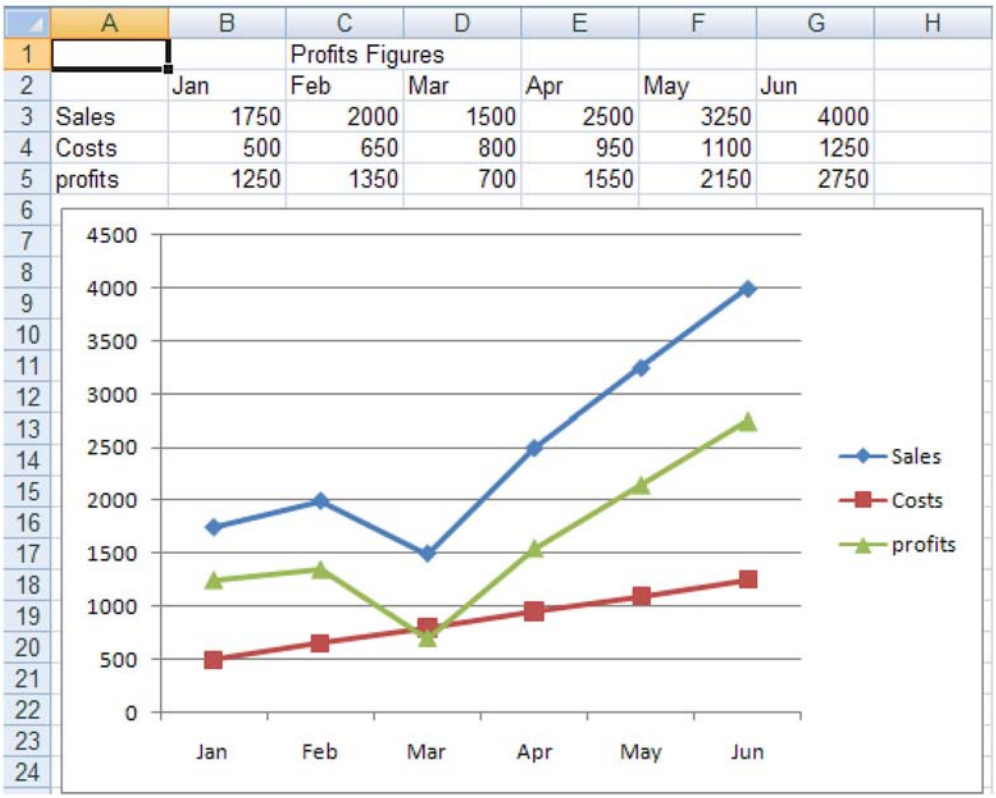
Custom Views

Custom views allow you to save different display and print settings, and impose them quickly and easily on the worksheet at any time. The settings which can be saved include print settings, row heights and column widths, display settings, selected cells, window size and positions, settings for panes and frozen titles. This can be advantageous when dealing with large worksheets where switching from one area to another might otherwise be awkward. It also allows a number of different print settings - including print area - to be saved as part of the same worksheet file.

Typical Custom View Model



In the example above, Sales, Costs and Profits data can be seen at the top of the screen, with an embedded line chart underneath. There is also an embedded pie chart, which, at the moment, can only be seen by scrolling down the spreadsheet. It would be useful to be able to "swap" between the line chart and the pie chart while still able to see the spreadsheet figures. It may also be helpful to define different page settings, depending on whether the line chart or pie chart is being printed. By defining different spreadsheet "views," it is possible to toggle between the different charts and keep the data on the screen at all times. It is also possible to print a different header when a different type of chart is displayed.

Defining Views

Before defining a view, you should ensure that the display options, zoom percentage, print settings etc. are as you wish to record them.

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To create a view:

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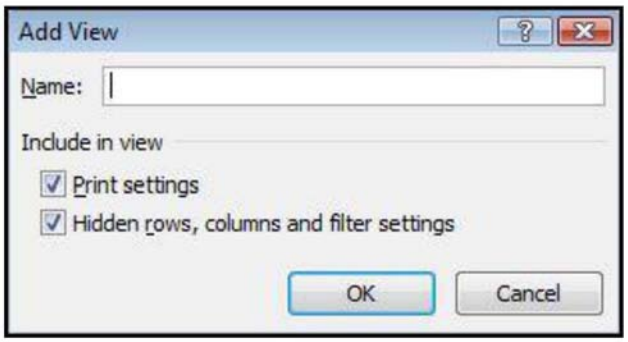
1. Click **CUSTOM VIEWS** from the **WORKBOOK VIEWS** group on the **VIEW** ribbon. The following dialog box will appear:
2. From the Custom Views dialog box, choose **ADD.**



3. Choose whether or not to include **PRINT SETTINGS** or **HIDDEN ROWSAND COLUMNS** as part of the View by checking the required options.
4. Enter the name under which this view is to be saved and click on **OK**.
5. Change settings and create more views

- *Once a view has been defined, the display and print settings of the worksheet can be changed (for example in our typical model you may want a view to display the pie chart next to the data with an appropriate header when printing). You can then set up a View that would save those settings.*

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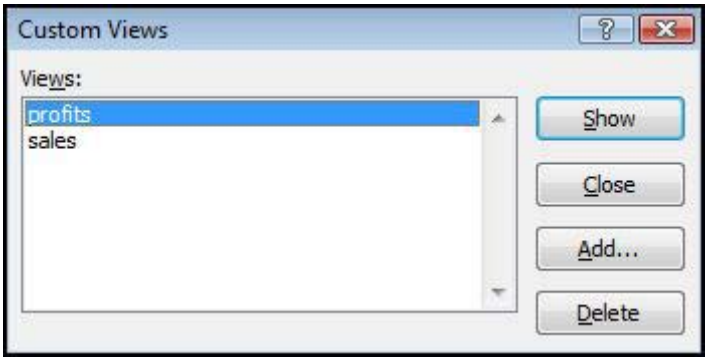
Showing A View

Having defined as many views as are needed for the current worksheet, you can switch between them.

To show a view:

Mouse



1. Click on the **VIEW** ribbon**WORKBOOK VIEWS** group, and **CUSTOM VIEWS**.
2. Click on the **SHOW** button. If Print or Print Preview commands are executed, the correct settings (including the header) will be apply to each view.

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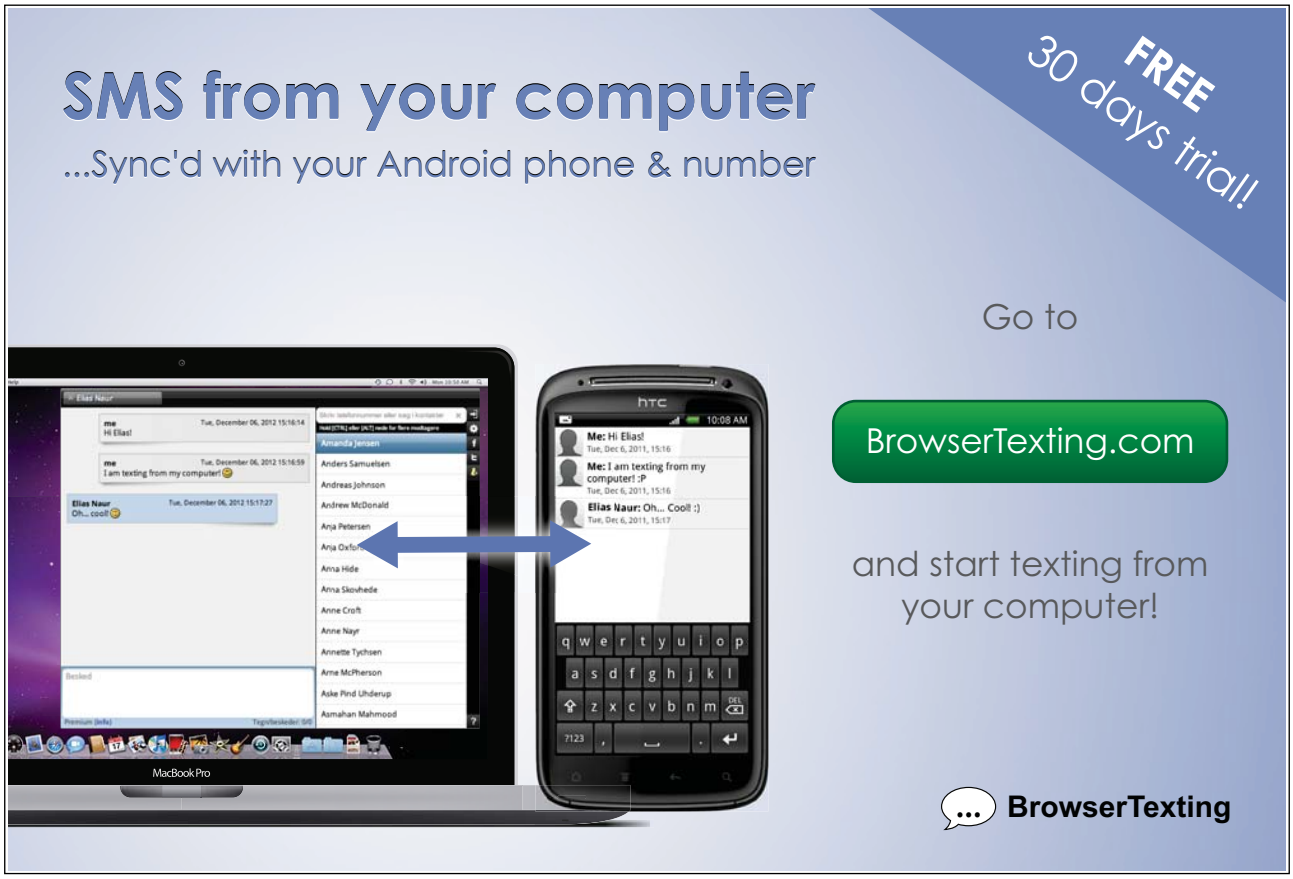

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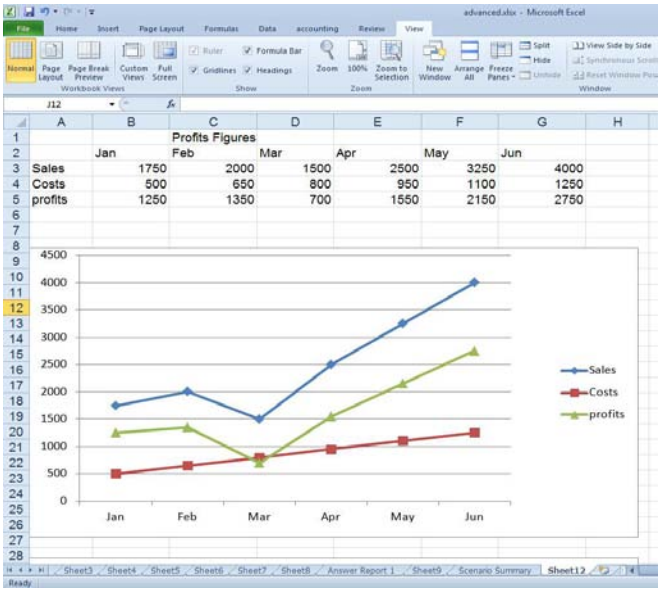

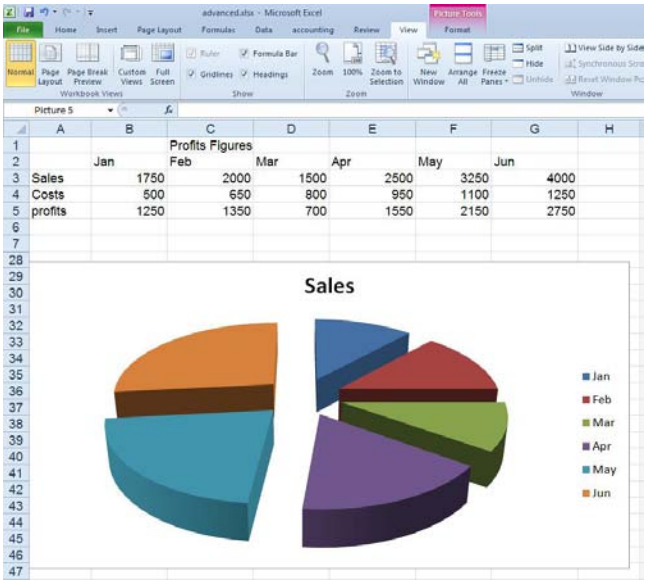

To delete a view:

Mouse

1. Click on the **VIEW** ribbon **WORKBOOK VIEWS** Group, and **CUSTOM VIEWS**.
2. Select a view you wish to delete.
3. Click the **DELETE** button.

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3 Using excel to manage lists

- **By the end of this section you will be able to:**
- Set up an Excel list
- Sort the list
- Create list subtotals
- Add, edit and delete list items using the data form.
- Use AutoFilter to find specific list data
- Use the Advanced filtering tools
- Analyse list data with data and PivotTables

Excel Lists,List Terminology

Although Excel's primary function is as a Spreadsheet, it can also be used for a number of list operations. It is possible to store, and manipulate information (customer records, staff records or stock inventories for example) on an Excel worksheet, organise it in different ways, and "query" the list to extract information which meets specific, user-defined criteria. The list is effectively treated as a database.

In order to use Excel's database capacity, information must be laid out in rows and columns subject to certain constraints. There are some database terms with which the user should become familiar:

Row And Column Content

The information being stored must be divided up into categories. For example, information on staff might include Firstname, Lastname and Department. In an Excel List, each category must be entered in a separate column. Do not mix text and numbers in a column – the data must belong to the same category of information and therefore should be the same data type. Do not use spaces in front of column entries, use alignment buttons instead if you need to move data away from the column edges.

Column Labels

This is the title at the top of each column, describing the category of information which it contains. Each label name must be unique and must be made up of text rather than numbers or calculations. The column names must appear directly above the list information - they may not be separated from the rest of the list by a blank row. Format your column labels to distinguish them from the list data.

List Size And Location

The List is the whole collection of information, all Fields, Fieldnames and Records and should be laid out as a regular block of data.(Over 16,000 columns and over 1,000,000 rows)

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Do not place more than one list on a worksheet. If you want more than one list in a workbook, place each list on a separate sheet. (this is only a guide it will not affect functionality but when working with lists hidden rows can cause severe problems with other lists on same sheet)

Leave at least one blank row and one blank column between the list and other data on the worksheet.

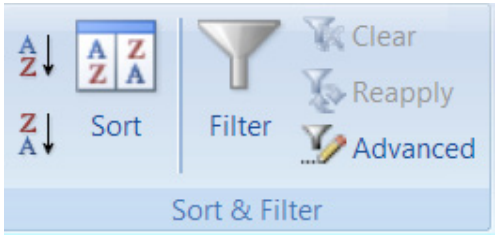
Place additional data diagonally below and to the right of your list. This ensures that data will not be affected when you filter the list.

Miscellaneous

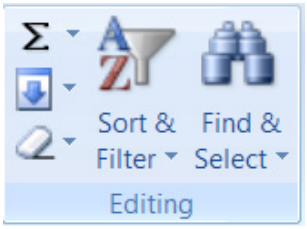
Excel does not distinguish between upper and lower case characters in a list, unless you use the Case-sensitive sort option.

When you use formulae in lists, Excel uses the results of the formulae.

Sorting Data



Although not confined to database information, the sorting facility in Excel is particularly appropriate for changing the order in which records are listed. Remember to save the file containing the database information prior to sorting.



If you will need to restore the original record order, it is a good idea to include a column of record numbers before sorting the database. This can be achieved simply by adding a column with a suitable heading, and using the fill handle or the data series command to enter consecutive numbers adjacent to each record.

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When using any data handling techniques ensure you have:

- *Selected a cell somewhere in the data list.*
- *Have **NO MORE** than one cell selected*

Excel automatically selects the entire list for sorting. It compares the top rows of your list for formatting differences. If there is a difference in the formatting of the top row, Excel identifies that row as column labels and excludes it from the sort. This ensures the column labels will not be sorted with the rest of the data.

Quick Sort

To perform a single-level sort: (quick sort)

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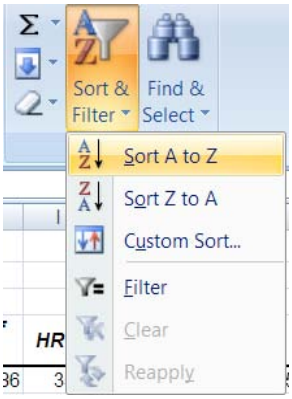
1. Select a cell in the list within the column by which you want to sort.
2. Click the **SORT ASCENDING** or **Sort DESCENDING BUTTON** from the **DATA** Ribbon, **SORT & FILTER** Group.

OR

Mouse



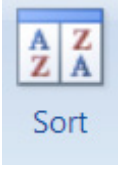
1. Click within the data to be sorted in the column you wish to sort by.
2. Click the **SORT A TO Z** or **SORT Z TO A** option from the **SORT & FILTER** button on the **HOME** Ribbon in the **EDITING** Group.
3. The data will be sorted alphabetically or numerically by that column.

Multi Level Sort

To perform a multi-level sort:

Mouse

1. Click within the data to be sorted.
2. Choose the **SORT**button from the **DATA** Ribbon, **SORT & FILTER** Group The following dialog box will appear in which from which you may specify the Sort fields and the Sort order.



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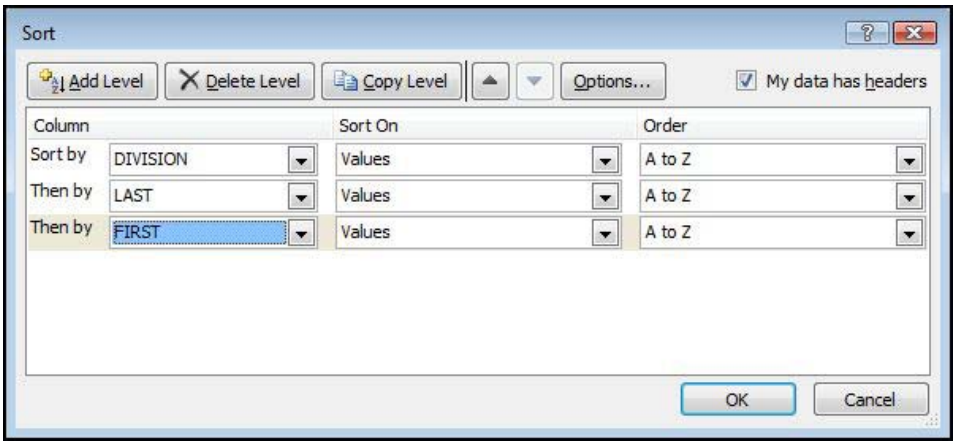
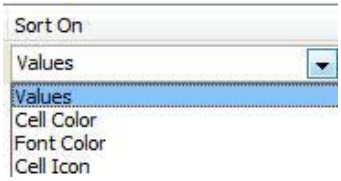
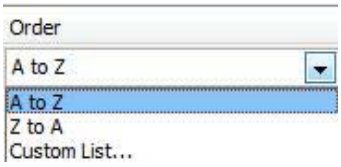


3. From the **Sort By** drop-down list, select the field you want to use as the main sort order.
4. Select from the next drop down list what you want to sort on by default this will be the data (values).





5. Select the **ASCENDING** or **DESCENDING**From the drop down list depending on which order you wish the data sorted in.
6. Select **ADD LEVEL**
7. Specify any sub-sorts using the **THEN BY** drop-down lists to pick the subsequent fields to sort by when duplicates occur in the main sort field.
8. You may add many levels to your sorting of data. If you wish to reorder your sorting levels use the reorder buttons by selecting a level and moving it up or down.

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9. If you have an incorrect level in your many sort orders select it and click on delete level.
10. Click **OK** to apply sort orders

OR

Mouse

1. Click the **CUSTOM SORT** option from the Sort & Filter button on the **HOME** ribbon in the **EDITING** group
2. The **CUSTOM SORT** dialog will appear.
3. Continue as previous
4. Click **OK** to apply sort orders

Custom Sorting Options

The ascending and descending sort orders rearrange your list by alphabetical, numerical, reverse alphabetical or reverse numerical order. For some types of data, such as months, this may not be the order that you need to use. You can use one of the custom sort orders provided with the Excel program to rearrange your data in chronological order by day of the week or by month.

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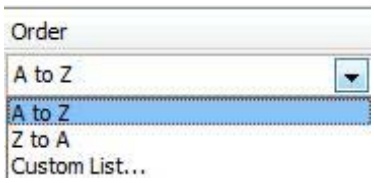
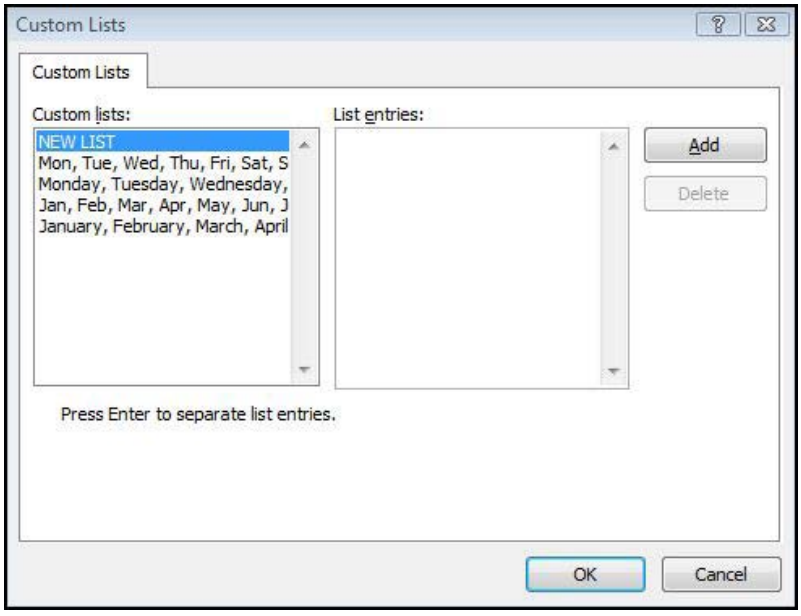
To sort by a custom sort order:



Mouse



1. Place the active cell within the list.
2. Click the Custom sort option from the Sort & Filter button on the **HOME** ribbon in the **EDITING** group

OR

1. Choose **SORT**, button from the **data** ribbon, **SORT & FILTER** group.
2. From the **SORT BY** drop-down list, select the column by which you want to sort.
3. From the **SORT ON** drop down list select what you want to sort on (Values)

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4. From the **ORDER** drop down list select **CUSTOM LIST**
5. The following dialog box will appear

6. Select a custom list from the left hand box.
7. Click on **OK**to close the list dialog and apply sort order to level and click on **OK** again to perform the sort.

Creating A Custom Sort Order

When sorting by ascending, descending or chronological order is not suitable for the data in a list, you can create a custom sort order. Custom sort orders enable you to give Excel the exact order to rearrange data. Custom sort orders are helpful for data such as Low, Medium, High, where neither alphabetical nor an existing custom sort order will provide the desired results.

To create a custom sort order:

Mouse

1. Click the **CUSTOM SORT** option from the **SORT & FILTER** button on the **HOME** Ribbon in the **EDITING** Group

OR

1. Choose the**SORT**, button from the **DATA** ribbon, **SORT & FILTER** group.

OR

2. Click on the **FILE RIBBON** and select the **OPTIONS** button. In the **ADVANCED** section . scroll down and click on the **EDIT CUSTOM LISTS** button

3. In the **CUSTOM LISTS** box, verify that **NEW LIST** is selected.
4. In the **LIST ENTRIES** box, type each unique entry in the order you want to sort the entries. Separate the entries by pressing **ENTER**.
5. Click **ADD** the list entries will appear in the left hand box

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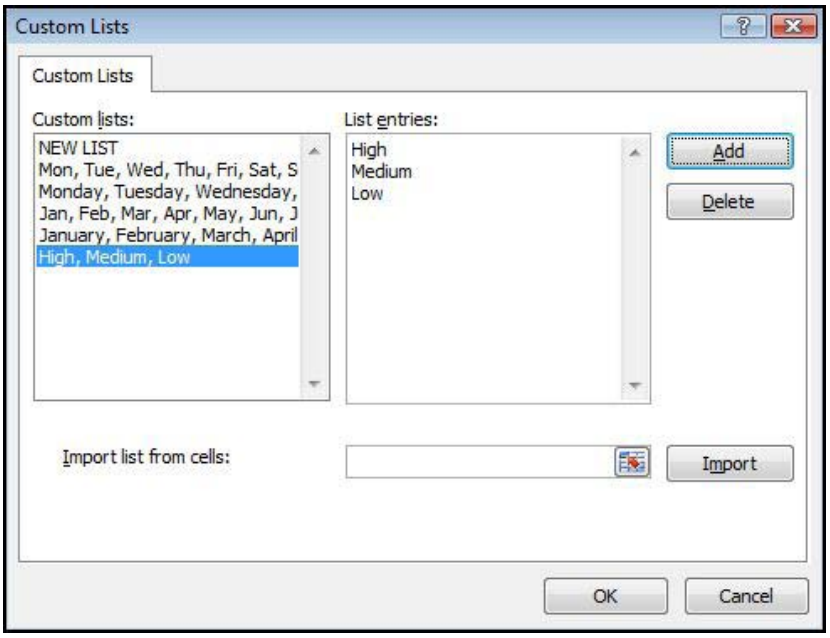

6. Click **OK**.

Custom sort orders are saved with the Excel 2010 program settings and are available for use with all worksheets. You can use a custom list with the AutoFill feature.

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Subtotals

Excel can automatically add subtotals to a list of data. Your subtotals can sum numeric data or find highest and lowest values and averages. You can also count the number of rows in a group.

Organising The List For Subtotals

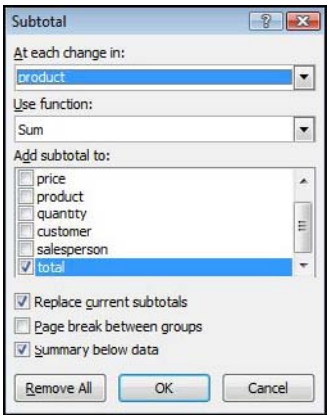
When you issue the subtotals command, Excel will need to know where to add the subtotals in. In the example adjacent, if you wanted to see subtotals for the revenue generated per product, you would first need to sort the list into Product order. Similarly, if you wanted to see how much each salesperson had sold; you would sort the list by Salesperson before adding the subtotals in.

Date	Price	Product	Quantity	Customer	Salesperson	Total
01/01/97	1.75	Gimlet	25	Barkers	Tom	43.75
03/01/97	1.50	Widget	25	Barkers	Eleanor	37.5
05/01/97	1.50	Widget	55	Barkers	Carol	82.5
07/01/97	1.75	Gimlet	25	Barkers	David	43.75
13/01/97	1.75	Gimlet	50	Barkers	Tom	87.5
17/01/97	5.00	Ratchet	20	Barkers	Carol	100
19/01/97	0.40	Wing Nut	225	Barkers	Eleanor	90
26/03/97	5.00	Ratchet	65	Barkers	Caroline	325
03/04/97	4.75	Sprocket	20	Barkers	Caroline	95
07/04/97	5.00	Ratchet	70	Barkers	David	350
13/04/97	4.75	Sprocket	10	Barkers	Tom	47.5
23/04/97	5.00	Ratchet	40	Barkers	Sharon	200
25/04/97	4.75	Sprocket	30	Barkers	Elliott	142.5
29/04/97	1.75	Gimlet	25	Barkers	Elliott	43.75
11/01/97	1.75	Gimlet	70	Dingles	Eleanor	122.5
29/01/97	5.00	Ratchet	55	Dingles	Eleanor	275

Create Subtotals

To add subtotals to a list:

Mouse



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1. Sort your List
2. Choose **SUBTOTALS** from the **OUTLINE** group on the **DATA** ribbon. The following dialog box will appear:
3. Click the drop-down list arrow to the right of the '**AT EACH CHANGE IN**' box to display your column headings. Pick the heading according to which column you have used to sort the data.
4. Click the drop-down list arrow to the right of the **USE FUNCTION** box to display a list of functions you can use to summarise data in your list. Click the function that you want.
5. Use the scroll arrows in the **ADD SUBTOTAL TO** list to set which columns you want to add the subtotals to. Check the box next to the column to subtotal. You can add subtotals to more than one column.
6. Set options for the new subtotals using the check boxes at the bottom of the dialog.
7. If you want each subtotalled group on a separate page, check **PAGE BREAK BETWEEN GROUPS**.
8. **SUMMARY BELOW DETAIL** adds subtotals and an overall total **below** the groups of data rather than above.
9. **REPLACE CURRENT SUBTOTALS** ensures that the new subtotals overwrite any existing ones.
10. Click **OK** to apply the subtotals.

Example:

Date	Price	Product	Quantity	Customer	Salesperson	Total	
13/01/97	1.75	Gimlet	50	Barkers	Tom	87.5	
01/01/97	1.75	Gimlet	25	Barkers	Tom	43.75	
07/01/97	1.75	Gimlet	25	Barkers	David	43.75	
08/03/97	1.75	Gimlet	75	House of Fraser	Carol	131.25	
27/01/97	1.75	Gimlet	25	House of Fraser	Caroline	43.75	
28/03/97	1.75	Gimlet	15	House of Fraser	David	26.25	
07/04/97	5.00	Ratchet	70	Barkers	David	350	Gimlet subtotal
14/03/97	5.00	Ratchet	60	Dingles	David	300	
20/02/97	5.00	Ratchet	35	House of Fraser	Eleanor	175	
17/04/97	5.00	Ratchet	25	House of Fraser	Elliott	125	
20/03/97	5.00	Ratchet	10	House of Fraser	Eleanor	50	Ratchet subtotal
25/04/97	4.75	Sprocket	30	Barkers	Elliott	142.5	
03/04/97	4.75	Sprocket	20	Barkers	Caroline	95	
13/04/97	4.75	Sprocket	10	Barkers	Tom	47.5	
09/04/97	4.75	Sprocket	60	Dingles	Carol	285	
30/03/97	4.75	Sprocket	25	Dingles	David	118.75	
28/02/97	4.75	Sprocket	10	Dingles	Sharon	47.5	
05/04/97	4.75	Sprocket	150	House of Fraser	Elliott	712.5	
09/01/97	4.75	Sprocket	100	House of Fraser	Tom	475	
16/02/97	4.75	Sprocket	60	House of Fraser	Caroline	285	Sprocket subtotal
05/01/97	1.50	Widget	55	Barkers	Carol	82.5	

To insert the subtotals shown above:-

1. Sort the list by **PRODUCT**. Choose **DATA** ribbon, **SUBTOTALS**.
2. At each change in **PRODUCT**, Use function **SUM**, Add subtotal to **TOTAL.**

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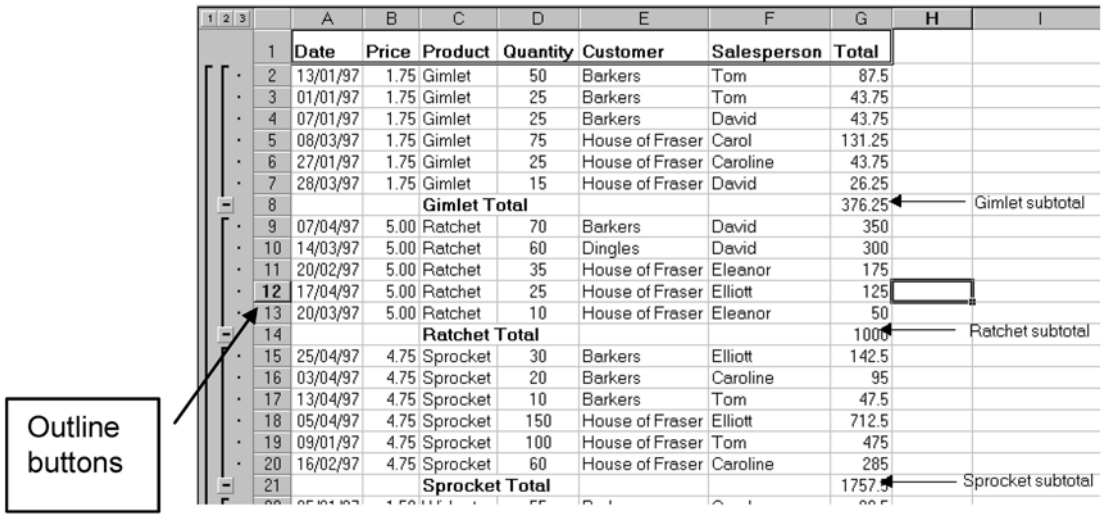

	Date	Price	Product	Quantity	Customer	Salesperson	Total
2	13/01/97	1.75	Gimlet	50	Barkers	Tom	87.5
3	01/01/97	1.75	Gimlet	25	Barkers	Tom	43.75
4	07/01/97	1.75	Gimlet	25	Barkers	David	43.75
5	08/03/97	1.75	Gimlet	75	House of Fraser	Carol	131.25
6	27/01/97	1.75	Gimlet	25	House of Fraser	Caroline	43.75
7	28/03/97	1.75	Gimlet	15	House of Fraser	David	26.25
8			**Gimlet Total**				376.25
9	07/04/97	5.00	Ratchet	70	Barkers	David	350
10	14/03/97	5.00	Ratchet	60	Dingles	David	300
11	20/02/97	5.00	Ratchet	35	House of Fraser	Eleanor	175
12	17/04/97	5.00	Ratchet	25	House of Fraser	Elliott	125
13	20/03/97	5.00	Ratchet	10	House of Fraser	Eleanor	50
14			**Ratchet Total**				1000
15	25/04/97	4.75	Sprocket	30	Barkers	Elliott	142.5
16	03/04/97	4.75	Sprocket	20	Barkers	Caroline	95
17	13/04/97	4.75	Sprocket	10	Barkers	Tom	47.5
18	05/04/97	4.75	Sprocket	150	House of Fraser	Elliott	712.5
19	09/01/97	4.75	Sprocket	100	House of Fraser	Tom	475
20	16/02/97	4.75	Sprocket	60	House of Fraser	Caroline	285
21			**Sprocket Total**				1757.5

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Summarising A Subtotalled List

Once you have added subtotals to a list, Excel gives you tools for collapsing the list so that you only see the grand total or subtotals. The outline symbols that appear to the left of the row numbers allow you to hide and show detail rows as needed.

·	9	07/04/97	5.00	Ratchet	70	Barkers	David	350
·	10	14/03/97	5.00	Ratchet	60	Dingles	David	300
·	11	20/02/97	5.00	Ratchet	35	House of Fraser	Eleanor	175
·	12	17/04/97	5.00	Ratchet	25	House of Fraser	Elliott	125
·	13	20/03/97	5.00	Ratchet	10	House of Fraser	Eleanor	50
−	14			**Ratchet Total**				1000

To hide detail for a group:

Mouse

1. Click the minus symbol that appears to the left of the row number where the grand/subtotal sits. All bracketed rows will be hidden.

Outline symbol

·	2	13/01/97	1.75	Gimlet	50	Barkers	Tom	87.5
·	3	01/01/97	1.75	Gimlet	25	Barkers	Tom	43.75
·	4	07/01/97	1.75	Gimlet	25	Barkers	David	43.75
·	5	08/03/97	1.75	Gimlet	75	House of Fraser	Carol	131.25
·	6	27/01/97	1.75	Gimlet	25	House of Fraser	Caroline	43.75
·	7	28/03/97	1.75	Gimlet	15	House of Fraser	David	26.25
−	8			**Gimlet Total**				376.25
+	14			**Ratchet Total**				1000

You can see where the hidden rows are because the outline symbol displays a plus sign.

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To show detail for a group:

Mouse

1. Click the plus symbol that appears to the left of the row number where the grand total/subtotal sits. All hidden rows will reappear.

Show And Hide By Level

When you add subtotals to a list, Excel gives you an overall total and subtotals per groups of sorted data. In the outline, Excel numbers these levels 1 for the grand total, 2 for the subtotals and 3 for the detail.

The numbers appear above the outline symbols and can be used to collapse and expand the rows by level.

To show only an overall total:

Mouse

2. Click the button marked **1** above the outline symbols. To show only totals:

		A	B	C	D	E	F	G
	1	Date	Price	Product	Quantity	Customer	Salesperson	Total
+	38			Grand Total				4519.8

Mouse

3. Click the button marked **2** above the outline symbols.

		A	B	C	D	E	F	G
	1	Date	Price	Product	Quantity	Customer	Salesperson	Total
+	8			Gimlet Total				376.25
+	14			Ratchet Total				1000
+	21			Sprocket Total				1757.5
+	30			Widget Total				1110
+	37			Wing Nut Total				276
−	38			Grand Total				4519.8

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To show all:

Mouse

1. Click the button marked **3** above the outline symbols.

	A	B	C	D	E	F	G
1	Date	Price	Product	Quantity	Customer	Salesperson	Total
2	13/01/97	1.75	Gimlet	50	Barkers	Tom	87.5
3	01/01/97	1.75	Gimlet	25	Barkers	Tom	43.75
4	07/01/97	1.75	Gimlet	25	Barkers	David	43.75
5	08/03/97	1.75	Gimlet	75	House of Fraser	Carol	131.25
6	27/01/97	1.75	Gimlet	25	House of Fraser	Caroline	43.75
7	28/03/97	1.75	Gimlet	15	House of Fraser	David	26.25
8			**Gimlet Total**				376.25
9	07/04/97	5.00	Ratchet	70	Barkers	David	350
10	14/03/97	5.00	Ratchet	60	Dingles	David	300
11	20/02/97	5.00	Ratchet	35	House of Fraser	Eleanor	175
12	17/04/97	5.00	Ratchet	25	House of Fraser	Elliott	125
13	20/03/97	5.00	Ratchet	10	House of Fraser	Eleanor	50
14			**Ratchet Total**				1000
15	25/04/97	4.75	Sprocket	30	Barkers	Elliott	142.5

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Remove Subtotals

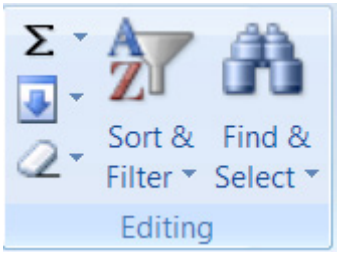
If you want to remove subtotals from a list, you can use the Remove subtotals command.

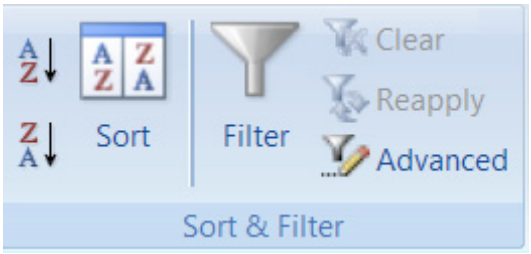
To remove subtotals:

Mouse

1. Click in the list with the subtotals
2. Choose subtotals from the Data ribbon. From the resulting dialog box, click the **REMOVE ALL** button. Any totals and outlines will disappear.

Filtering A List





When you filter a list, you display only the sets of data that meet a certain set of search conditions called ***criteria***. The AutoFilter feature enables you to specify those search conditions from the list.

When you use the Data, Filter, AutoFilter command, drop-down list arrows are displayed next to each of the column labels in the list. When you open a drop-down list, a list of all the unique entries for that column is displayed. By selecting one of the entries from the drop-down list, called a **filter criterion** you instruct Excel what to search for. Then Excel filters the list so that only the sets of data that contain the entry you selected will be displayed. When Filter mode is active, arrows for the columns with filter criterion selected appear in blue on the worksheet, row numbers appear in blue, and the status bar displays either the number of rows that meet the criteria, or the text "Filter mode." The sets of data that do not meet the criteria remain in the list but they are hidden.

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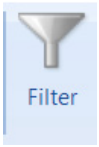
Autofilters

If you select a single cell in the list before choosing Filter drop-down list arrows are applied to all of the column labels in your list. If you select multiple column labels before choosing Filter drop-down list arrows are displayed only for the selected columns, thus restricting which columns you can apply filters to. In either case, the entire list is filtered. Also, you can filter only one list at a time on a worksheet.

To filter a list using AutoFilter:

Mouse

1. Place the active cell anywhere within your list.
2. Click the **filter** option from the **SORT & FILTER** button on the **HOME** ribbon in the **EDITING** group



OR

1. Choose **FILTER**, button from the **DATA** Ribbon, **sort & Filter** group.Your list column labels will appear with drop-down list arrows to the right.
2. When you select the drop down arrow from the top of a particular column you will have (depending on the data type) a box at the bottom of the menu with all unique values make sure the values you wish to be seen are **TICKED**. Select the values you are filtering for.(Following Pictures)
3) When all values you wish to see are ticked (this creates **OR** conditions for that column) click **OK** to apply the filter for that column

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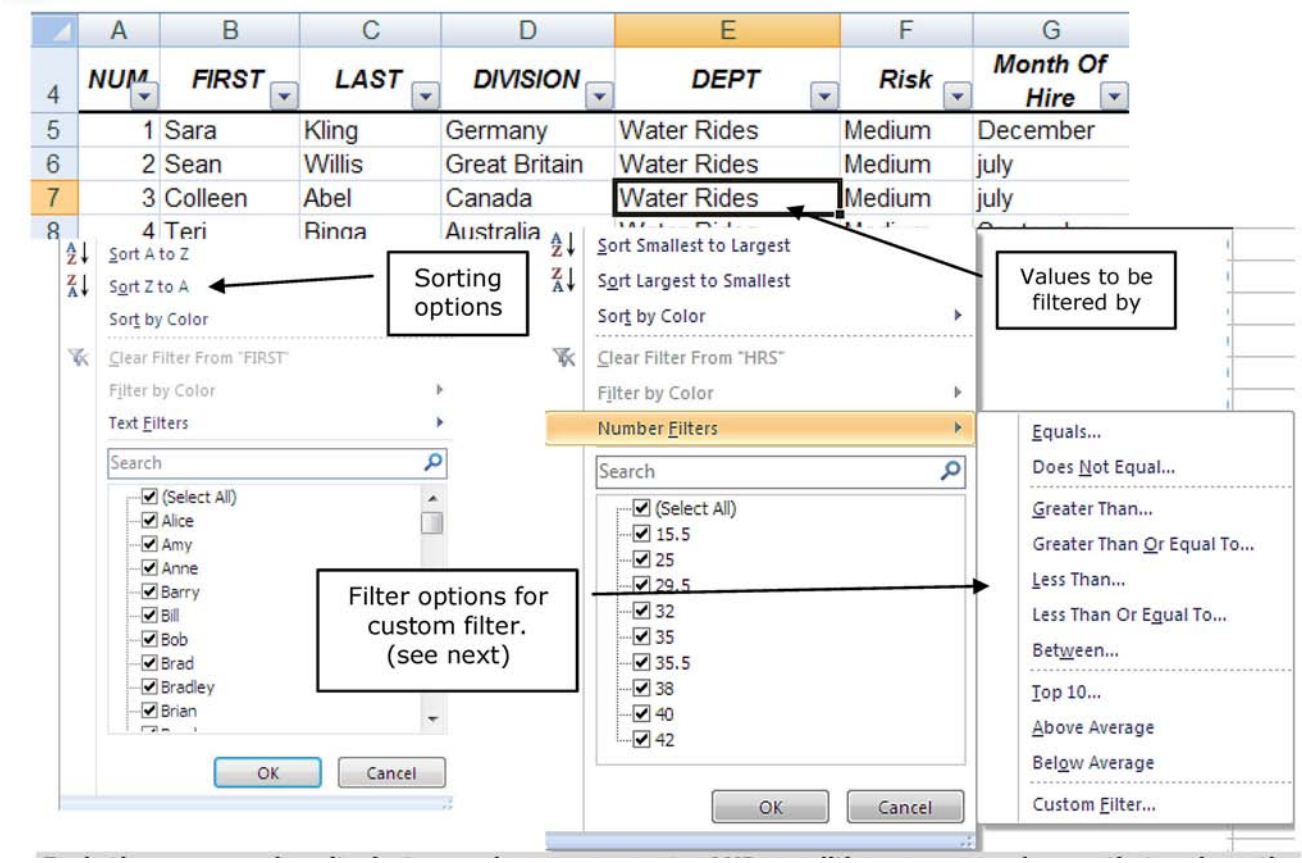
OR

You have sort order options at the top part of the menu which work in the same manner as previously discussed if you select a sort order this will close the menu and apply the filter.

4) Repeat step **3** until you have set filter criteria for all columns that you wish to filter by.
5) The list will show only those rows that match your criteria.



Each time you apply criteria to a column you create AND conditions across columns that reduce the number of records that will be displayed. Using the simple autofilter OR conditions cannot be applied across columns. (see advanced filter). More AND conditions = less records. Whilst a filter is active, if you print the worksheet, only visible rows will be output, so you can print out multiple views of your data from an individual list.

Search Criteria

A new feature in 2010 is the ability to use a search box to find values "**CONTAINING" !!!!** what you type.Selecting and unselecting criteria when there are only several variations is one thing but since you could have a million rows of data with thousands of names or companies for example this could take forever using the standard Autofilter to untick what you do not want. The search box helps tremendously in cutting down the possibilities before you start unticking boxes. As it will limit what appears to values that **ONLY CONTAIN** what you type.

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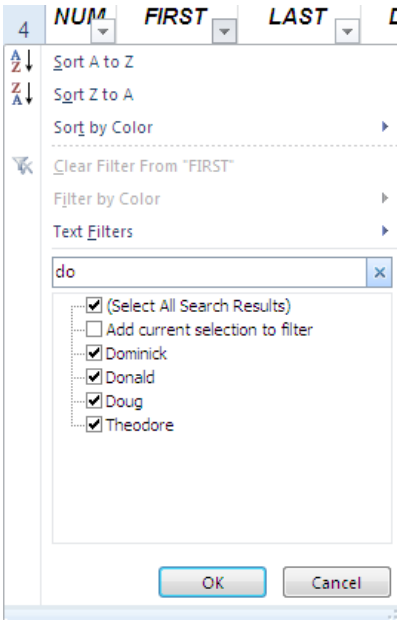

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Mouse

1. Click on the **AUTOFILTER** drop-down for the desired column.
2. Click in the search box and type characters common to what values you may wish to select.
3. The number of values that need unticking reduce dramatically.
4. Untick any other values you do not wish. Click on **OK** to apply filter.

Removing a single column filter:

Mouse

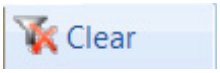
1. You can see which columns have filter criteria active because the drop-down list arrows are blue. Click the drop-down list arrow for the column whose criteria you wish to remove. And choose the tick box that says select all.
2. All values will be selected for display again. Either click **OK** or select new sort order to show all records.

Removing all column filters:

Mouse

3. Click the **CLEAR** option from the **SORT & FILTER** button on the **HOME** Ribbon in the **EDITING** group

OR



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1. Choose **FILTER**, button from the **DATA** ribbon, **SORT & FILTEr** group. And click **CLEAR**.
2. All column filters will be cleared

When filters are cleared the SELECT ALL tick box is applied to all columns. Make sure that this method is the one you really want if you have selected complicated criteria in a particular column.

Custom Criteria And - Or

When you specify a filter criterion for a column from unique entries listed in the AutoFilter drop-down list, you can only select one filter criterion at a time. The Custom filter criterion enables you to filter a list to display sets of data that contain This creates an OR condition or complicated options of what text, dates or numbers you wish to display To meet the filter criteria, a set of data must meet either the first filter criterion or the second filter criterion or both

You can also use the Custom criterion choice to find values that fall within a range. When you specify custom criteria, select a comparison operator from the drop-down list and then either type in a value or select it from the criteria drop-down list.

When you use custom criteria, you need to understand the comparison operators that Excel offers you. The table below outlines these:

Operator	**Meaning**
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

To specify "either AND/OR" custom criteria:

Mouse

1. Click on the **AUTOFILTER** drop-down for the desired column.
2. Depending on the Data type of the column, the data type and type of filter name will appear. (picture shows number filter)
3. You may select one of the options shown to start your custom filter **OR** move to the bottom of the menu and select **CUSTOM FILTER**.
4. The following dialog box will be shown.
5. In the **CUSTOM AUTOFILTEr** dialog box from the first criteria drop-down list select one of the filter criteria. (The default operator is = "equals").

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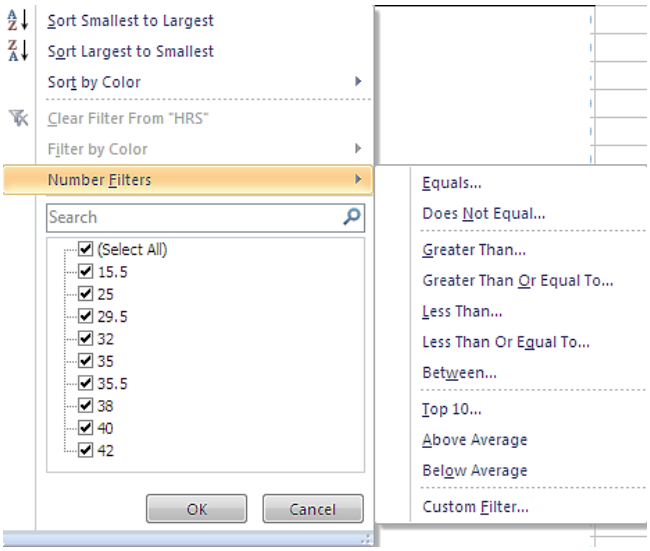

6. Choose **OR**. (meets one set of ctriterie **OR** the second)
7. From the second operator drop-down list, select a comparison operator.
8. From the second criteria drop-down list select the other filter criterion.
9. Click **OK**. The filtered list shows the sets of data that meet either the first or the second specified criterion for the column.

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Using custom criteria to find a range of values:

Mouse

1. Click the drop-down arrow for the column label whose range of values you want to filter by.This will typically be numbers or dates.
2. Click **CUSTOM FILTER**. From the resulting dialog box, select the comparison operator to control the lower limiting value, for example greater than or greater than or equal to.
3. From the first criteria drop-down list, select a value or type the value in.
4. Select**AND** as the data **MUST** meet **BOTH** conditions to display the range.
5. From the second criteria drop-down list select the other filter criterion.
6. Click **OK**. The filtered list shows the sets of data that meet **BOTH** the first and the second specified criterion for the column.

Wildcards

You can use wildcards to search for text in common within the unique entries, even though the entire entry might not match. For example, searching for all of the sets of data that have entries in the last-name column that begin with "M" might display two Moore's (where the entire entry matches) but might also display Madding and Martinez (where the entire entry does not match).

Wildcard	Finds	Example
* asterisk	Any set of characters that are in the same position as the asterisk	*.xls finds Filter.xls and sortdata.xls
? question mark	Any single character that is in the same position as the ?	B?t finds Bat, Bit, But and Bet
~ tilde	A question mark or an asterisk	Who~? Finds the text "Who?"

To filter a list using wildcards:

Mouse

7. With **AUTOFILTER** active, select the drop-down list arrow to the right of the column you want to use to filter the data.

Wildcards only work when filtering columns containing text

8. Choose **CUSTOM**.
9. Ensure that the operator is set to =.
10. Type the pattern of letters you are filtering by with the asterisks and/or question marks inserted in the appropriate positions.
11. Click **OK**.

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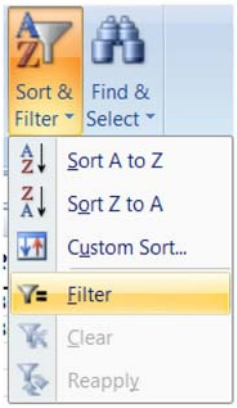
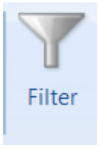
Turning Off Autofilter

To switch off AutoFilter:

Mouse





1. Choose **FILTER**, button from the **DATA** Ribbon, **SORT & FILTER** Group.
   OR

2. Click the **Filter** option from the **SORT & FILTER** button on the **HOME** ribbon in the **EDITING** group

3. The AutoFilter option on the submenu will appear ticked showing that AutoFilter is currently active. Click AutoFilter to remove the tick and deactivate the AutoFilter.

Advanced Filtering

Sometimes, the filter criteria that you specify with AutoFilter will not yield the necessary results. For example, you cannot use AutoFilter to filter a list to display the more complex criteria of two separate AND conditions combined with an OR condition. To do this, you must use the Advanced Filter option. This relies on you setting up and defining a Criteria range on the worksheet where the data to be matched can be entered.

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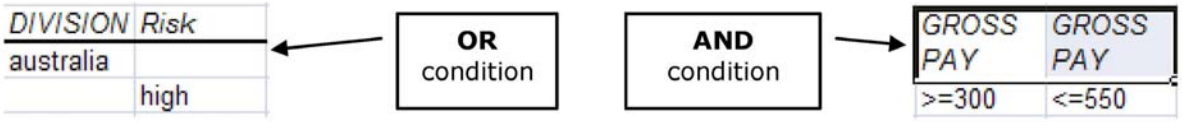
Set Criteria In Advanced Filter

The Criteria range usually consists of a copied set of the list column names, and a blank row immediately beneath into which you can type the data to be matched. It is a good idea to copy the column names from the top of the database into the area to be used as a criteria range, as this reduces the chance of there being any discrepancy between the two sets of names.

In fact, not all the column labels need to be included in the criteria range. It could be restricted to only those labels on which you wished to search, and those labels included could be displayed in a different order. If you wish and criteria to create a range you may need to copy a particular column label twice.



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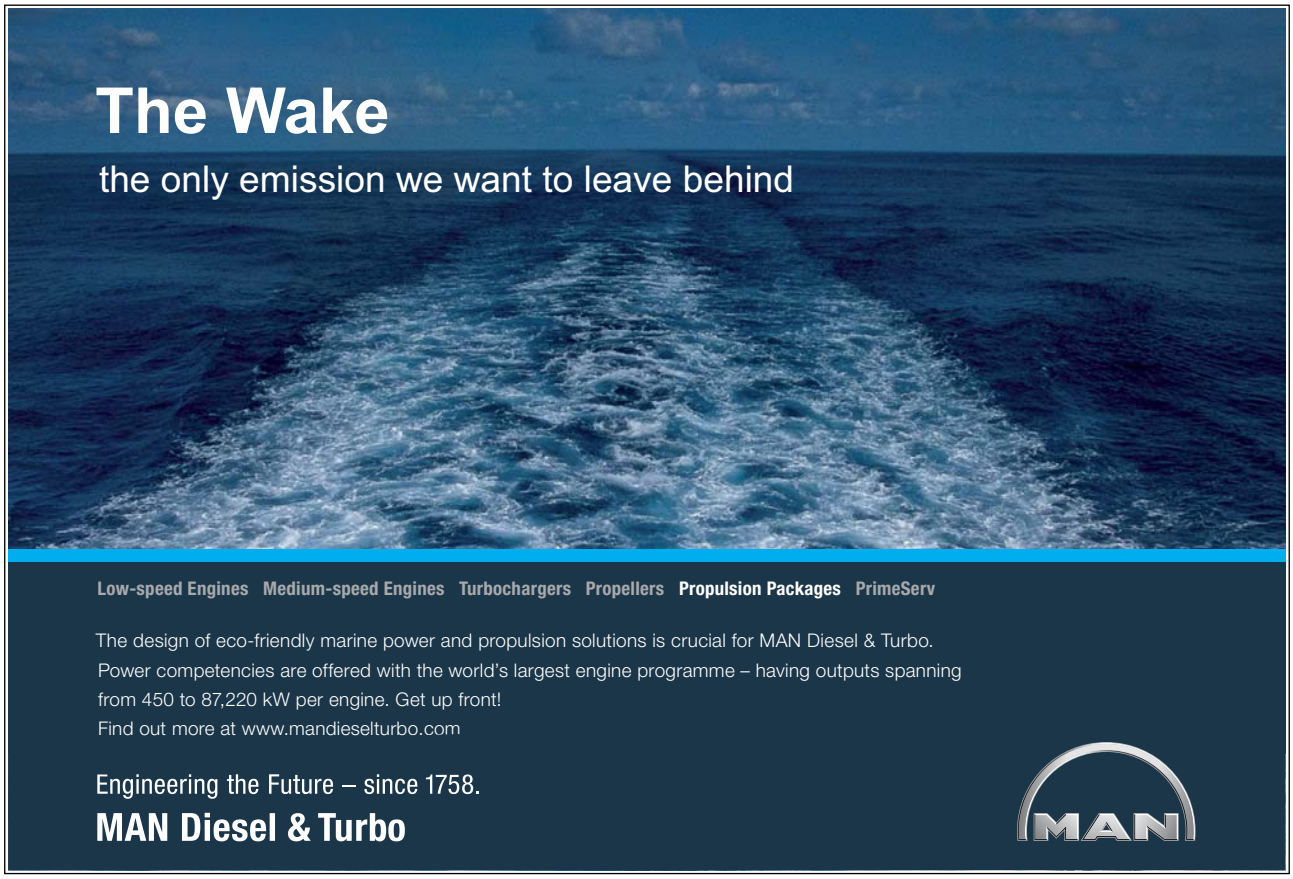
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To define the Criteria range:

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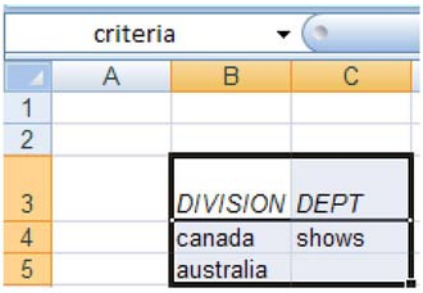
1. Copy across to a new sheet the column labels you wish to create criteria for.
2. Create the criteria in the cells under the labels.
3. If criteria are created in the same row, this would create an **AND** condition and on different rows this would create an **OR** condition.



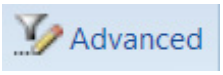
4. Select the copied set of column labels and the criteria below and name the cell range if you wish. (not essential) Type the word *Criteria* into the name box and press **[ENTER]**.

You do not have to name the cells with the range name Criteria, but it will ensure that Excel automatically picks the correct group of cells as the criteria carrying cells whenever you use the Advanced Filter.

To run an advanced filter:

Mouse

1. Click within your data list



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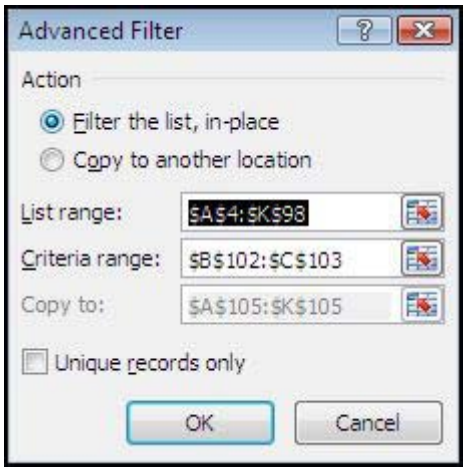

2. Choose **ADVANCED**, button from the **DATA** ribbon, **SORT & FILTER** group.
3. The following dialog will be displayed
4. You should see that your data list is selected completely. If not (due to empty columns or rows.) Delete the values in the list range box and either type in the range you wish or select the correct range with the mouse
5. In the criteria range box either type *criteria* (if you named the range) or delete any values present and select your criteria from your sheet of criteria.
6. By default the list will be filtered in place as when using the AutoFilter.
7. Click **OK**. You will be returned to your data list with the filter applied.
8. Sort if needed

To remove a filter:

Mouse

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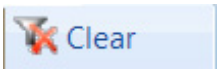
1. Click the Clear option from the **SORT & FILTER** button on the **HOME** ribbon in the **EDITING** group

OR

1. Choose **FILTER**, button from the **DATA** Ribbon, **SORT & FILTER** group.
2. The filter will be cleared



Criteria Tips

At a basic level criteria entered in the Criteria range is subject to the limitations mentioned earlier but making use of a user defined Criteria range allows more complex searches to be performed.

It is important to remember to clear the old filter and select new criteriaand delete old criteria from either the custom filter or the advanced filter before applying a new filter. Otherwise the true results of a filter will not be shown. For example, if the first filter is applied with Johnson entered under Surname, and a subsequent filter is carried out for those who work in Finance, it is essential that the Name specification is cleared unless you deliberately wish to confine the filter to those people called Johnson who happen to work in the Finance department.

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Excel will find records matching text information entered in the Criteria range, and records where the initial letters match the specified data. When working with a user defined criteria range, if you wish to confine filter results to only those records where, for example, the first name is Rob, it would be necessary to enter the formula =”=Rob” in the Criteria range under the appropriate column label.

Criteria Entered	Results Matched
Rob or Rob*	Rob; Robert; Robin
=”=Rob”	Rob

Wildcards With Text Criteria

One variation on searches for text criteria consists of using text Wildcard symbols. The two Wildcard symbols may be familiar to users of other PC systems.

The Asterisk

The Asterisk (*) may be substituted for any group of characters. Searching for *Banking would find both Development Banking and Merchant Banking. If no Wildcard symbols are included in the search criteria, Excel usually assumes that there is an asterisk at the end of the specification, so it will match the data specified and any records where the initial data is the same.

The Question Mark

The Question Mark (?) may be substituted for any single character. The question mark identifies the position of the wildcard character within the string of text. T?m would find Tim or Tom. ?a would find all records where the second letter in the appropriate field was an A. Once again, Excel will assume that there is an asterisk on the end of the search specification unless otherwise informed. Entering T?m in a Firstname field would find Tim, Tom and Tommy. Use the syntax =”=T?m” to confine the searches to three characters in length.

Check The Criteria Range

If you are getting surprising results when you filter your data, it may be because your criteria range contains unlabelled cells or extra rows that you thought you had removed from the range.

It is easy to double check the currently defined Criteria range at any time by making use of the range name which Excel applies to it. Using the [**F5**] function key will result in a dialog box showing all the currently named ranges on the worksheet. Click on the name Criteria and choose **OK**. The area covered by that name will be highlighted. You may choose to alter the selection and redefine the Criteria range again to adjust it.

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Multiple Criteria

Hitherto, the Criteria range has been described as a copied set of field names into which you may enter search specifications under the appropriate column names. You may choose to enter criteria in the blank row under more than one field name. Entering Finance as the department and 7 as the grade for example, would find only those persons who met both criteria.

Multiple criteria on the same row dictates that the first specification AND all other specifications must be met in order for Excel to find the record. (See also use of the AND() function under Calculated Criteria).

Using Multiple Rows In The Criteria Range

There may be situations where you wish to find members of either Division or Risk. In such an instance the Criteria range can be extended to include a second row into which you may enter specifications:

DIVISION	*Risk*
australia	
	high

Extending the criteria range for OR criteria:

Mouse

1. If you named your criteria range then you may wish to first delete the current *Criteria* range name. choose **NAME MANAGER** from the **FORMULAS** ribbon. In the **DEFINED NAMES** group.
2. Select **CRITERIA** from the names list inside the dialog and click **DELETE.**
3. Close the dialog box
4. Create your criteria on your criteria worksheet as necessary. Now, entering search specifications in all rows within the range will allow Excel to identify all those records which meet the specifications in either, the first OR the second row etc. (See also use of the OR() function under Calculated Criteria).
5. Highlight the entire region to be redefined as the Criteria range - i.e. the copied set of Column names and the two rows (or more) immediately below, then, Name the range again if you wish. (if previous named criteria are still present then ensure a different name is used to identify this criteria.).
6. Apply advanced filter as previously discussed.

The Criteria range may be extended to include three or more rows of user defined search criteria if required.

To return to using just one row of user defined information in the Criteria range, select the area to be included and redefine the Criteria range again. This is important because searching for data when a row in the Criteria range has been left blank, will result in Excel finding every record in the database. In effect, you have asked Excel to find all records where the contents of any field can be anything at all.

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Calculated Criteria

Basic Calculation

You may also choose to find data subject to calculated criteria rather than exactly matching data or using comparison operators or wildcard characters. This would let you find data that matches the result of a formula, rather than a value that you have entered directly

For this we need to use the **NAME MANAGER** to help us with our advanced filter.

To use calculated criteria:

Mouse

1. Include in the **CRITERIA RANGE** one column name which is not used in the list - Calc for example.
2. Delete any named criteria from the **NAME MANAGER**
3. Select the column labels (including *Calc* or whatever you have named it) plus at least one row below them depending on whether you need use multiple OR conditions to filter your data.
4. Create a named range using the **NAME BOX** or **NAME MANAGER** for this range call it criteria
5. Build a calculation in the calc column (see example below)
6. Apply **ADVANCED FILTER** using the ***criteria*** name as criteria

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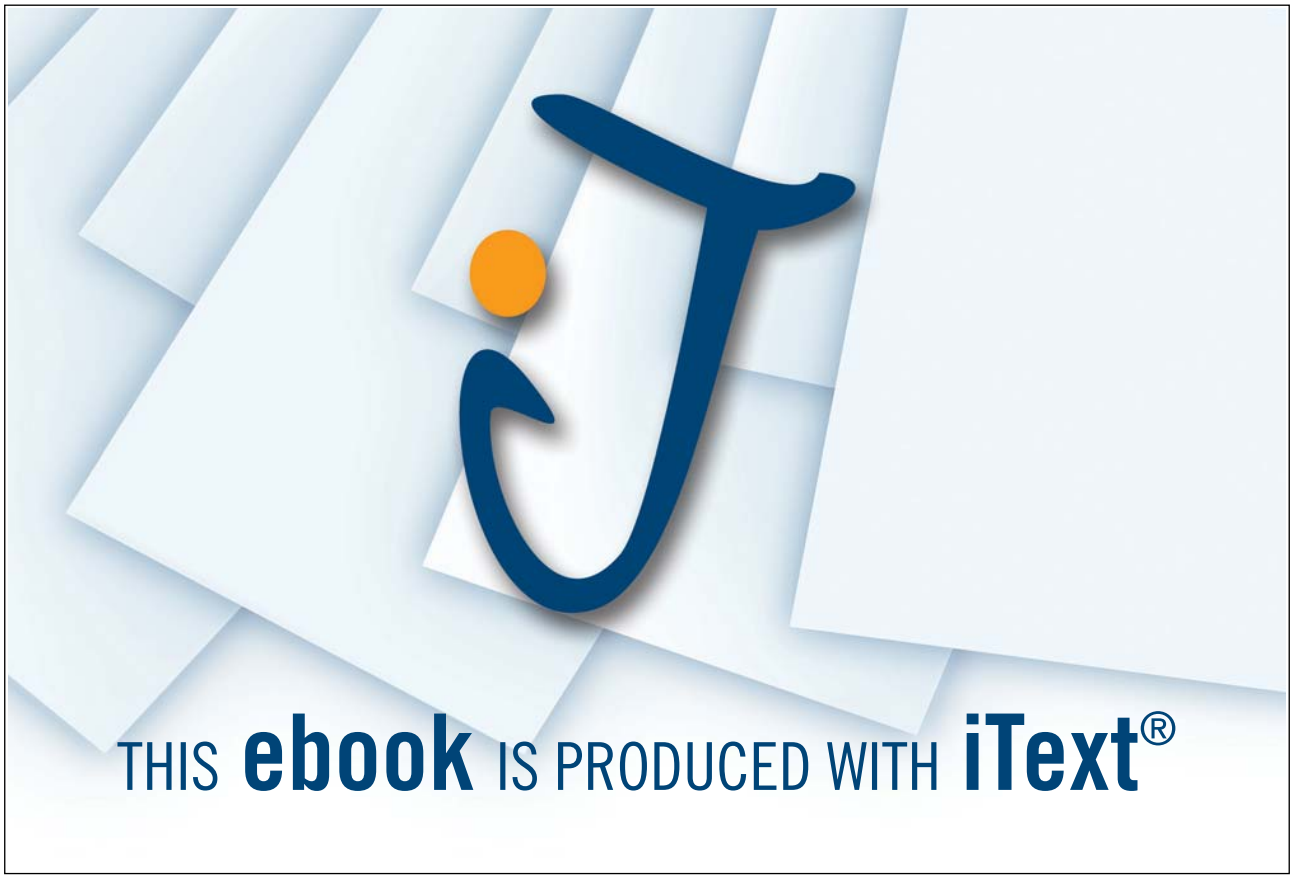

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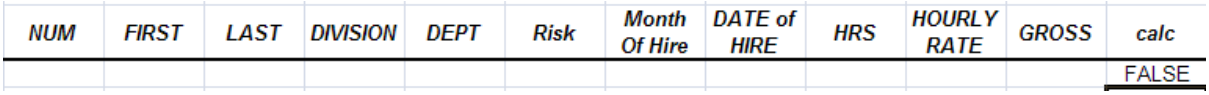
Below the calculated fieldname in the criteria range, you must enter a formula which refers to the cells contained in the first record of the database. The formula must result in a TRUE or FALSE answer.

In the example below, in order to find only those records where the value of the gross for Australia would increase to over 500 a 10% increase was applied, the formula shown could be entered in the *Calc* column.

When entered, the calculated formula displays on the worksheet as TRUE or FALSE depending on the figures contained in the first record of the database to which the formula specifically refers. The underlying formula displays in the formula bar as usual.



You may use calculated fields to refer to and manipulate cells within the first record of the database, and to refer to cells outside of the database area. For example, the threshold figure of 500 might be held in an input cell outside the database. If this was the case, that cell reference could be included in the calculated search criteria, but the reference to it would need to be absolute or fixed.

Calculated Criteria Using Functions

Some of Excel's Logical Functions are particularly suited to setting Criteria for a list search. Rather than having to extend the criteria range, you can specify criteria as arguments within the **AND()**, **OR()** or **NOT()** functions.

=AND()

If there are several specifications, every one of which must be met by all records found, use the **AND()** function and refer once again to the cells contained in the first record of the database. Text entries must be enclosed in double quotes. The **AND()** function may contain up to 30 comma separated arguments

Referring to the database in the diagram below, for example, if the **gross** (**L2**) must be greater than or equal to 400, the **division** (**E2**) Australia and the **risk** (**G2**), medium. The calculated function might be set as appears on the Formula bar:

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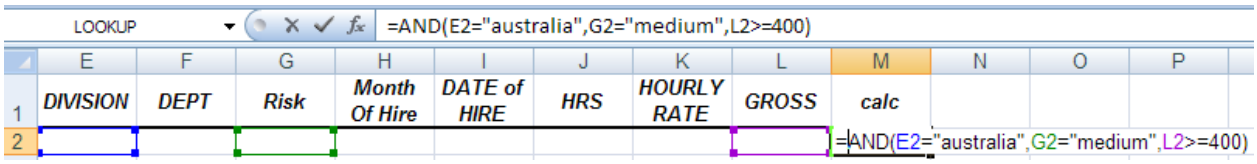
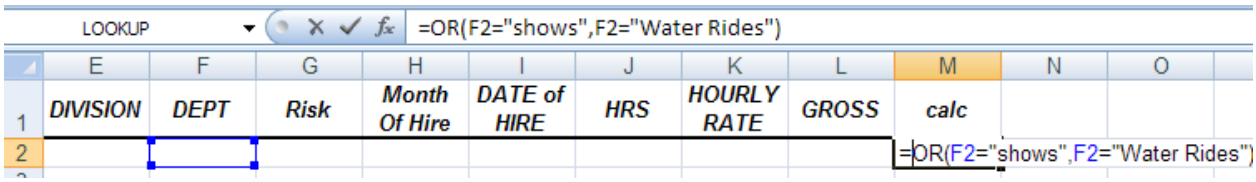

LOOKUP
=AND(E2="australia",G2="medium",L2>=400)
E F G H I J K L M N O P
1 DIVISION DEPT Risk Month Of Hire DATE of HIRE HRS HOURLY RATE GROSS calc
2
=AND(E2="australia",G2="medium",L2>=400)

=OR()

Searching for two different entries in the same field would necessitate the use of the **OR()** function. You may wish to locate all the records where the **Dept** (**F2**) is either shows or water rides. Obviously the **AND()** function will be inappropriate, because the customer cannot be both companies simultaneously. Instead, the calculation might be:


LOOKUP
=OR(F2="shows",F2="Water Rides")
E F G H I J K L M N O
1 DIVISION DEPT Risk Month Of Hire DATE of HIRE HRS HOURLY RATE GROSS calc
2
=OR(F2="shows",F2="Water Rides")

Excel will find any records where any one of the arguments contained in the **OR()** function is met. The **OR()** function may contain up to 30 comma separated logical arguments.

=NOT()

The NOT() function can be used to exclude records meeting certain criteria from the find operation. Entering a calculation such as:

=NOT(DIVISION=”Canada”)

This will allow Excel to find all those records where the Division is anything other than Canada. The NOT() function contains only one argument. It can be combined with other functions, for example:

=AND(NOT(DIVISION=”Canada”),Hrs<20)

This will find all those records for divisions other than Canada where the Hrs worked was less than 20.

Copying Filtered Data

You can use the Advanced Filter command to copy the sets of data that meet the criteria in the Criteria range to another location on the worksheet.

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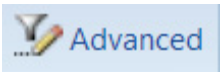

To copy filtered data to another location:

Mouse

1. Set the Criteria range.
2. Place the active cell within the list.
3. Choose **ADVANCED**, button from the **DATA** ribbon, **SORT & FILTER** group.
4. In the resulting dialog box, choose **COPY TO ANOTHER LOCATION**.
5. In the **COPY TO** text box, enter a worksheet cell that represents the top left-hand corner of where you would like the results.
6. Click **OK**.

	A	B	C	D	E	F	G	H	I	J	K
101											
102		GROSS	GROSS								
103		>=300	<=550								
104											
105	NUM	FIRST	LAST	DIVISION	DEPT	Risk	Month Of Hire	DATE of HIRE	HRS	HOURLY RATE	GROSS
106	41	Kathy	Mayron	Great Britain	Adult Rides	High	May	19-May-86	40	£8.22	£328.80
107	60	Edward	Trelly	Australia	Children's Rides	Low	June	17-Jun-86	40	£8.75	£350.00
108	22	Jacqueline	Banks	Australia	Shows	None	february	02-Feb-84	40	£8.75	£350.00
109	36	Peter	Allen	Australia	Water Rides	Medium	May	31-May-86	40	£8.75	£350.00
110	4	Teri	Binga	Australia	Water Rides	Medium	September	07-Jun-88	40	£8.75	£350.00
111	71	Maria	Switzer	Germany	Children's Rides	Low	June	03-Jun-91	29.5	£13.30	£392.35
112	32	James	Abel	Great Britain	Children's Rides	Low	february	05-Feb-91	35	£12.10	£423.50
113	64	Lynne	Simmons	Australia	Children's Rides	Low	November	23-Nov-88	35	£12.10	£423.50
114	69	Shirley	Dandrow	Canada	Children's Rides	Low	march	14-Mar-91	35	£12.10	£423.50

Data copied to

If you want to copy only certain columns from the matching sets of data, enter the column labels exactly as they appear in the list in the location you want to copy to. When you run the filter, set the Copy To range reference to the cells where you have typed the column labels. You may only use this on the sheet your data is on you cannot copy to another sheet that will have to be done manually later.

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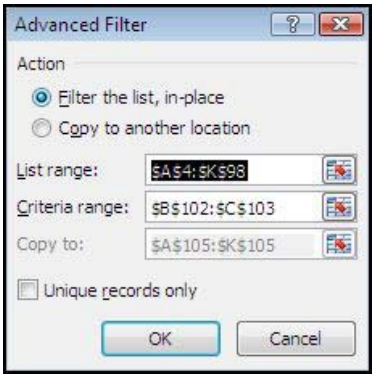
Unique Records



There is a check box [a]allowing you to select Unique records only. This may be useful if, for example, the Copy To range does not include all the column labels. There may be several records where the division and last name are the same. If the Hourly rate, hrs, Date of hire fields etc are not included in the Copy To range, this could result in several seemingly identical records being extracted. Checking the Unique records only check box before choosing **OK** would result in Excel extracting only the first record in each instance.

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Database Functions

There are several Excel functions which are specifically designed to enable you to analyse database information. A selection of these appears in the table below.

Function	Purpose
DCOUNT(Database,Field,Criteria)	To count the number of records in a list which meet specified criteria. This function will only count value cells.
DCOUNTA(Database,Field,Criteria)	To count the number of records in a list which meet specified criteria. This function includes text and value cells.
DSUM(Database,Field,Criteria)	To add the contents of the chosen field in a list, subject to any specified criteria.
DMIN(Database,Field,Criteria)	To find the minimum value in the chosen field in a list, subject to any specified criteria.
DMAX(Database,Field,Criteria)	To find the maximum value in the chosen field in a list, subject to any specified criteria.
DAVERAGE(Database,Field,Criteria)	To find the average value of the chosen field in a list, subject to any specified criteria.
DGET(Database,Field,Criteria)	To return the contents of the chosen field subject to any specified criteria. This function is only valid where a single record meets the criteria set.
DPRODUCT(Database,Field,Criteria)	To multiply the contents of the chosen field in a list, subject to any specified criteria.

In all cases, if the Criteria range is blank, these functions will apply to the entire list area. Once data is entered in the Criteria range, the results of the Database functions will adjust to reflect only those records meeting the criteria.

The arguments for all of these functions are identical, and the easiest way to incorporate them into a worksheet is by using the **PASTE FUNCTION** dialog.

Database

The range that incorporates the entire database including column labels. This can be made into a named range. (if the data range changes then just edit the named range rather than all your functions)

Field

The field you wish to sum or average etc. such as the total column only the column heading needs to be selected.

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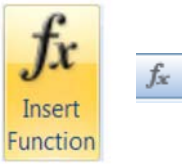
Criteria

The range (as in advanced filter) that contains your criteria. The data is filtered in memory according to these criteria to give you a sum or average from the **FIELD** column.

To enter a database function on the worksheet:

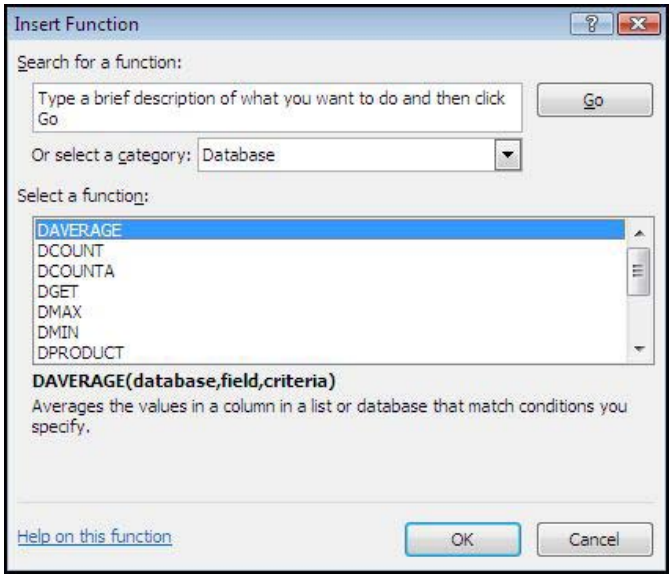
Mouse

1. Click the**INSERT FUNCTION** button from **FORMULA LIBRARY** on thE **FORMULAS** ribbon



OR

1. Click the **INSERT FUNCTION** button from the left hand side of the **FORMULA BAR.**
2. The following dialog box will appear



3. In the function category list, select **DATABASE**.
4. From the **FUNCTION NAME** list choose the database function you require:
   e.g.=**DAVERAGE()**
5. Click **OK** another dialog will appear.

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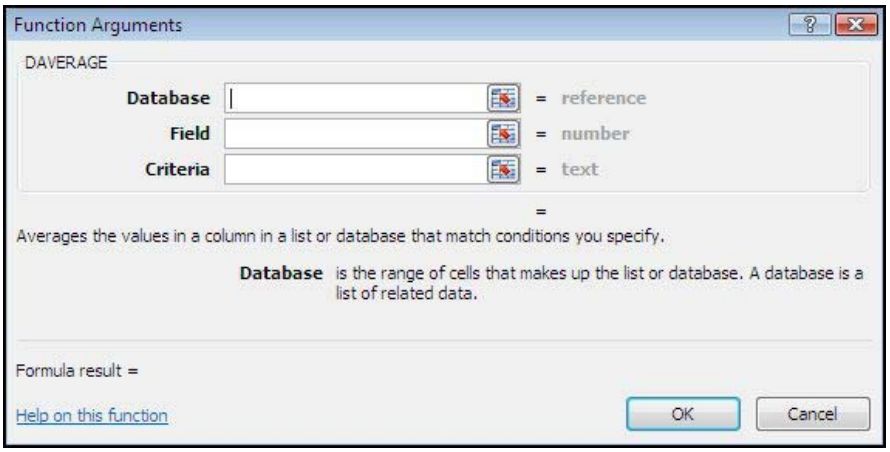

6. Enter the three arguments, **LIST RANGE**, **FIELD NAME** and **CRITERIA RANGE**.
7. Press **[ENTER]** or click **OK**

D3 =DMAX(A7:M101,M7,criteria!C10:C11)

	A	B	C	D	E	F	G	H
1								
2								
3		max gross pay for canada		880				
4		High risk australians		4				
5								
6								
7	NUM	FIRST	LAST	EMP#	DIVISION	DEPT	Risk	Month Hir
8	1	Sara	Kling	GW29	Germany	Water Rides	Medium	Decem
9	2	Sean	Willis	GBW09	Great Britain	Water Rides	Medium	July
10	3	Colleen	Abel	CW58	Canada	Water Rides	Medium	July
11	4	Teri	Binga	AW55	Australia	Water Rides	Medium	Septem
12	5	Frank	Culbert	GBC07	Great Britain	Children's Rides	low	June

In the above example, the formula shown on the formula bar above has been entered into the cell to the right of the label "Max gross pay for Canada." This formula finds the maximum gross pay for all records where the division is Canada. All the database functions look at what has been entered in the criteria range in order to give their results.

If you have assigned the range name* Database *to your* list area *and* Criteria *to your criteria range you use can [F3] to paste the names.

The field may be entered as a number or as text. Obviously, if the field on which the function is to operate is the fifth column within the database, you could enter the number 5 as the field argument. Alternatively, the field name could be entered as text, in which case it would need to be enclosed in double quotes:

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=DMAX(database,"division",criteria)

Data Consolidation

To summarize and report results from separate worksheets, you can consolidate data from each separate worksheet into a master worksheet. The worksheets can be in the same workbook as the master worksheet or in other workbooks. When you consolidate data, you are assembling data so that you can more easily update and aggregate it on a regular or ad hoc basis.

	A	B	C	D	E
1	**European Division**				
2					
3	*Item*	*QTR1*	*QTR2*	*QTR3*	*QTR4*
4	Bonnets	500	800	900	1000
5	Funnels	400	100	800	800
6	Reels	200	500	500	400
7	Trays	200	300	500	300
8		1300	1700	2700	2500
9					

E.G.If you have a worksheet of sales figures for each of your divisional offices, you might use a consolidation to roll up these figures into a corporate sales worksheet. This master worksheet (All divisions) might contain sales totals or averages for the entire enterprise.

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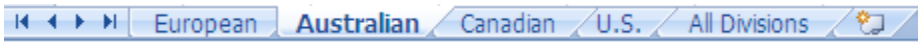
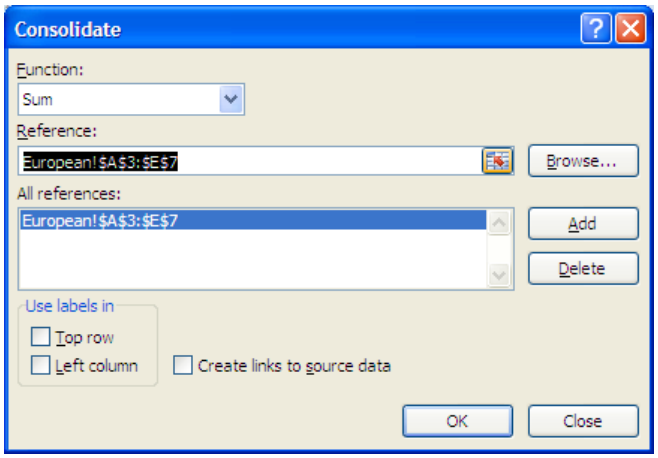


To consolidate data

Mouse

1. Name a new sheet to summarise your aggregate data (consolidated data) go to the top left hand cell on that sheet where you would like to start aggregate your data. In example above the cell would possibly be **A3** on all divisions sheet.)

- *Make sure that you leave enough cells to the right and below this cell for the consolidated data. The **CONSOLIDATE** command populates the area as needed*



2. On the **DATA** ribbon in the **DATA TOOLS** group, click on consolidate the **CONSOLIDATE** dialog box is displayed.
3. From the **FUNCTION** drop down box select which function you wish to apply to the consolidated data ranges (default is sum)
4. Click in **REFERENCE** text box. Select one of the sheets you wish to consolidate and select the data on that sheet the range will appear in the **REFERENCE** box you will notice it is absolute.

- *If the worksheet is in another workbook, click **BROWSE** to locate the file, and then click **OK** to close the **BROWSE** dialog box. The file path is entered in the **REFERENCE BOX** followed by an exclamation point.*
- *Alternatively,(and easier) ensure all workbooks that have sheets to be consolidated are already open. Then just like selecting the range click in the **REFERENCE** box, then select the workbook from the **TASKBAR**, select the sheet then the range and click on **ADD**.*
- *Be consistent with your selections although the ranges may be in different locations on different sheets, either, select the labels on **ALL THE SHEETS** with the data to be consolidated **OR NONE AT ALL**.*

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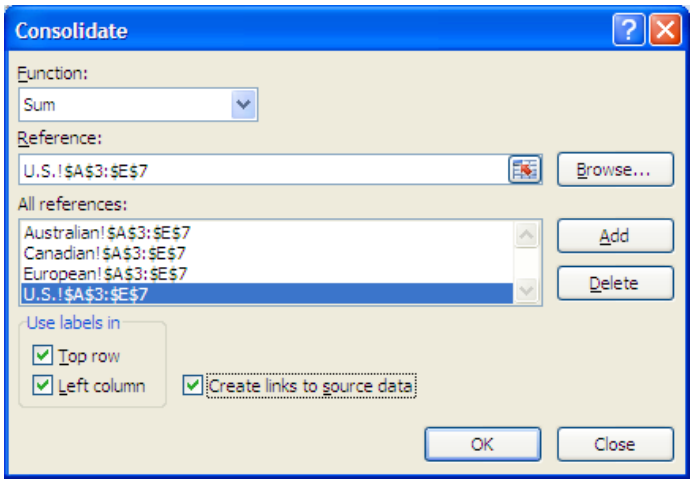
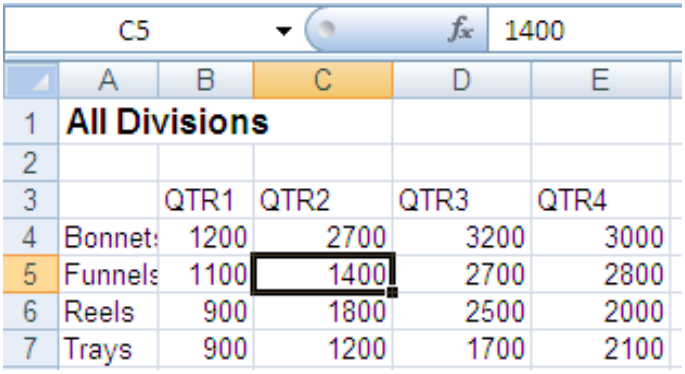
5. Click on **ADD,** the range will appear in the **ALL REFERENCES** box if the wrong range has been selected select it in the **ALL REFERENCES** box and click on **DELETE**.



6. Repeat the previous two steps until all data ranges to be consolidated have been selected and added to **ALL REFERENCES** box.
7. If you selected labels in your data ranges then tick the check boxes in the **USE LABELS IN** area. Select **TOP ROW** and/or **LEFT COLUMN.**
8. The data when consolidated can be automatically updateable by selecting the check box **CREATE LINKS TO SOURCE DATA**. This ensures as your data changes so will your consolidated data.

You can only select this check box if the worksheet is in another workbook. Once you select this check box, you won't be able to change which cells and ranges are included in the consolidation.

To set up the consolidation so that you can update the consolidation manually by changing the included cells and ranges, clear the Create links to source data check box.



9. If you are satisfied with all ranges selected and options selected, click **OK**.
10. The data will be consolidated onto your summary worksheet

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11. Use the group buttons as you would in subtotals to show and hide the related information (These only appear when Linked to original data.)

C14 =Australian!$B$6

	A	B	C	D	E	F
1		**All Divisions**				
2						
3			QTR1	QTR2	QTR3	QTR4
8		Bonnets	1200	2700	3200	3000
13		Funnels	1100	1400	2700	2800
14		3Dsheets2	300	400	1400	700
15		3Dsheets2	200	500	500	600
16		3Dsheets2	200	500	500	400
17		3Dsheets2	200	400	100	300
18		Reels	900	1800	2500	2000
23		Trays	900	1200	1700	2100

If you selected the** create links to source data **check box your data will be automatically outlined (see left and below** name box**) use these outlines as you would in** subtotals**. The** create links to source data **check box works best when consolidating across workbooks as you can see in the above picture across sheets enters the sheet name in the B column repeatedly you would have to change this manually but across workbooks the filename is entered there to inform you of the source of the data.

If you did not use the** create links to source data **check box then the data will be consolidated and put into your cells as values (averaged or summed as you chose)

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Pivottables

A PivotTable can summarise large amounts of data using specified calculations and formats. It is called a PivotTable because the headings can be rotated around the data to view or summarise it in different ways.

The source data can be:

- *An Excel worksheet database/list or any range that has labelled columns.*
- *A collection of ranges to be consolidated. The ranges must contain both labelled rows and columns.*
- *A database file created in an external application such as Access or Dbase.*
- *The data in a PivotTable cannot be changed as it is the summary of other data. The data itself can be changed and the PivotTable recalculated. The PivotTable can be reformatted.*

Important Information

The PivotTable cache.

Each time that you create a new PivotTable report or PivotChart report, Excel stores a copy of the data for the report in memory, and saves this storage area as part of the workbook file. Thus, each new report requires additional memory and disk space. However, when you use an existing PivotTable report as the source for a new report in the same workbook, both reports share the same copy of the data. Because you reuse the same storage area, the size of the workbook file is reduced and less data is kept in memory.

Location requirements

To use a PivotTable report as the source for another report, both reports must be in the same workbook. If the source PivotTable report is in a different workbook, copy the source report to the workbook location where you want the new report to appear. PivotTable reports and PivotChart reports in different workbooks are separate, each with its own copy of the data in memory and in the workbook files.

Changes affect both reports

When you refresh the data in the new report, Excel also updates the data in the source report, and vice versa. When you group or ungroup items in one report, both reports are affected. When you create calculated fields or calculated items in one report, both reports are affected.

PivotChart reports

You can base a new PivotTable report or PivotChart report on another PivotTable report, but you cannot base it directly on another PivotChart report. However, Excel creates an associated PivotTable report from the same data whenever you create a PivotChart report, so you can base a new report on the associated report. Changes to a PivotChart report affect the associated PivotTable report, and vice versa.

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Changing An Existing Report's Source Data

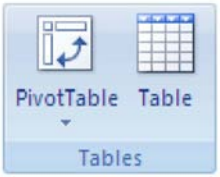
Changes in the source data can result in different data being available for analysis. For example, you may want to conveniently switch from a test database to a production database. You can update a PivotTable report or a PivotChart report with new data that is similar to the original data connection information by refreshing the report.

To include additional data or different data, you can redefine the source data for the report. If the data is substantially different with many new or additional fields, it may be easier to create a new report.

Displaying new data brought in by refresh

Refreshing a report can also change the data that is available for display. For reports based on worksheet lists, Excel retrieves new fields within the source range or named range that you specified. For reports based on external data, Excel retrieves new data that meets the criteria for the underlying query or data that becomes available in an OLAP cube. You can view any new fields in the Field List and add the fields to the report.

Create A PivotTable



To create a PivotTable or PivotTable with PivotChart:

Mouse

1. Select a cell in a range of cells of data, or put the insertion point inside of an Excel table.
2. Make sure that the range of cells has column headings.

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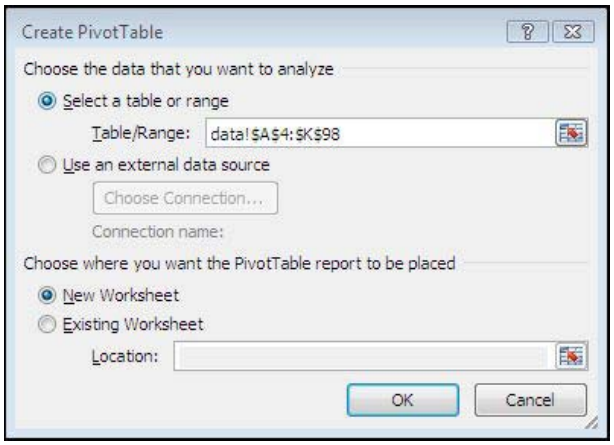

3. Do one of the following: To create a PivotTable report, on the **INSERT** ribbon, in the **TABLES** group, click **PIVOTTABLE**, and from the menu click **PIVOTTABLE**.
4. The **CREATE PIVOTTABLE** dialog box is displayed.

OR

5. To create a PivotTable and PivotChart report, on the **INSERT**ribbon, in the **TABLES** group, click **PIVOTTABLE**, and then from the menu click **PIVOTCHART**.

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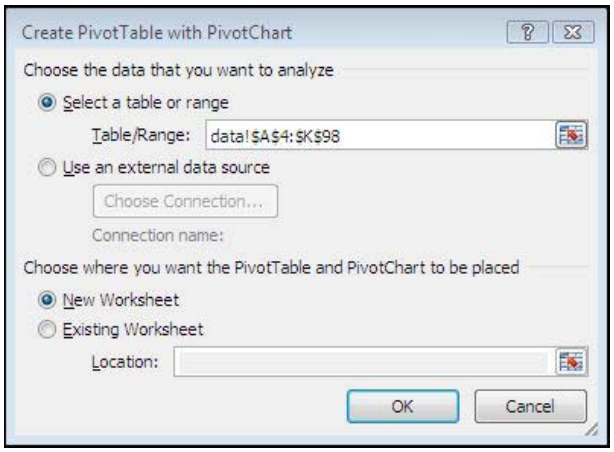

6. The **Create PivotTable with PivotChart** dialog box is displayed.

Select A Data Source

To Select a data source.

Mouse

1. Click **SELECT A TABLE OR RANGE**.
2. Type the range of cells or table name reference, such as =QuarterlyProfits, in the Table/Range box.
3. If you selected a cell in a range of cells or if the insertion point was in a table before you started the wizard, the range of cells or table name reference is displayed in thE **TABLE/RANGE** box.

OR

4. To select a range of cells or table, click **COLLAPSE DIALOG BUTTON** to temporarily hide the dialog box, select the range on the worksheet and then press **EXPAND DIALOG** .

- *If the range is in another worksheet in the same workbook or another workbook, type the workbook and worksheet name by using the following syntax:*
  ([workbookname]sheetname!range).

OR

- *Have the other work book open and switch to it while in the table/range box and select your data.*

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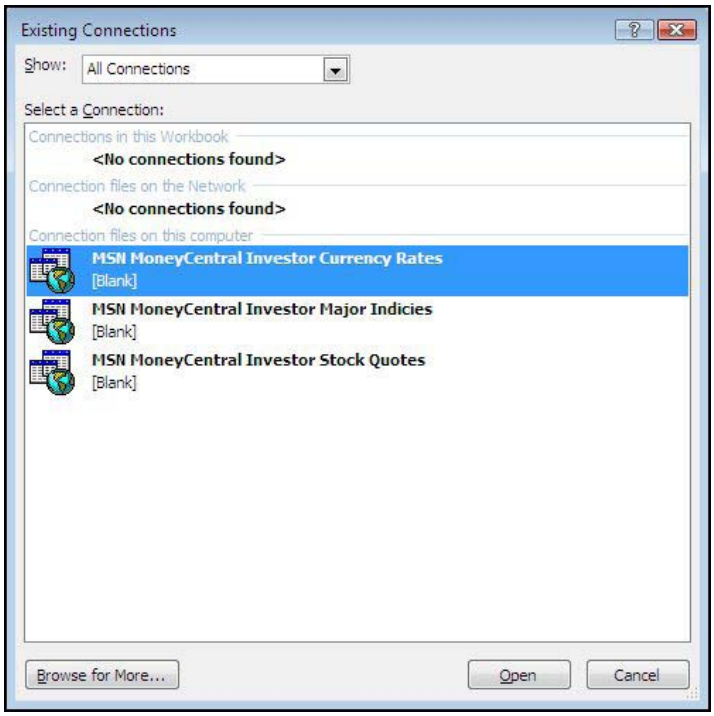
Use external data

Mouse

1. Click **USE AN EXTERNAL DATA SOURCE**.



2. Click **CHOOSE CONNECTION.**
3. The **EXISTING CONNECTIONS** dialog box is displayed.
4. In the **SHOW** drop-down list at the top of the dialog box, select the category of connections for which you want to choose a connection or select **ALL CONNECTIONS** (which is the default).
5. Select a connection from the **SELECT A CONNECTION** list box, and then click **OPEN**.

If you choose a connection from the Connections in this Workbook category, you will be reusing or sharing an existing connection. If you choose a connection from the Connection files on the network or Connection files on this computer the connection file is copied into the workbook as a new workbook connection, and then used as the new connection for the PivotTable report.

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Set A Location

To Enter a location.

Mouse

1. To place the PivotTable report in a new worksheet starting at cell **A1**, click **NEW WORKSHEET**.
2. To place the PivotTable report in an existing worksheet, select **EXISTING WORKSHEET**, and then type the first cell in the range of cells where you want to locate the PivotTable report.

OR

3. click **COLLAPSE DIALOG** to temporarily hide the dialog box, select the beginning cell on the worksheet and then press **EXPAND DIALOG** .
4. Click **OK**.
   An empty PivotTable report is added to the location that you entered with the PivotTable Field List displayed so that you can start adding fields, creating a layout, and customizing the PivotTable report.

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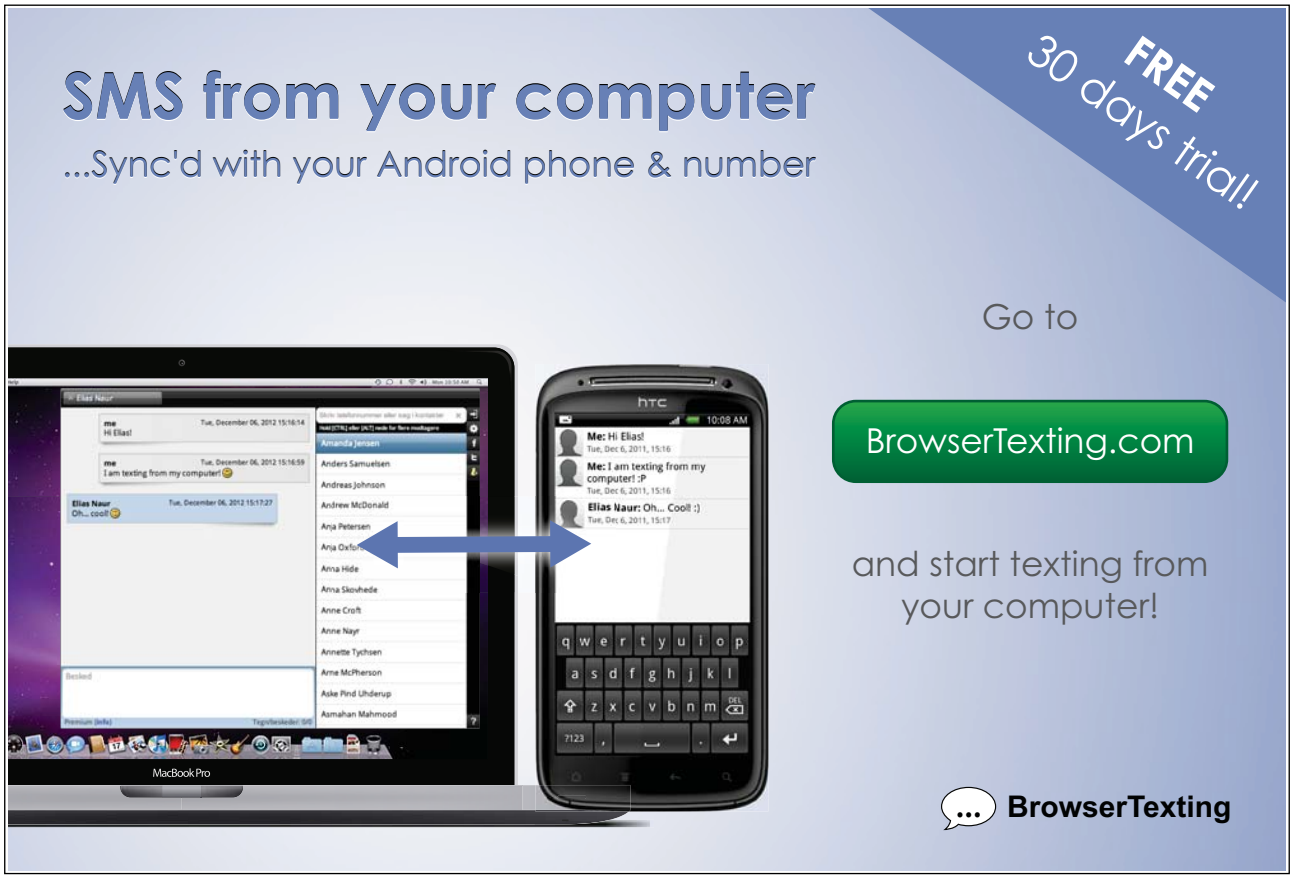

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Create A PivotChart From The PivotTable

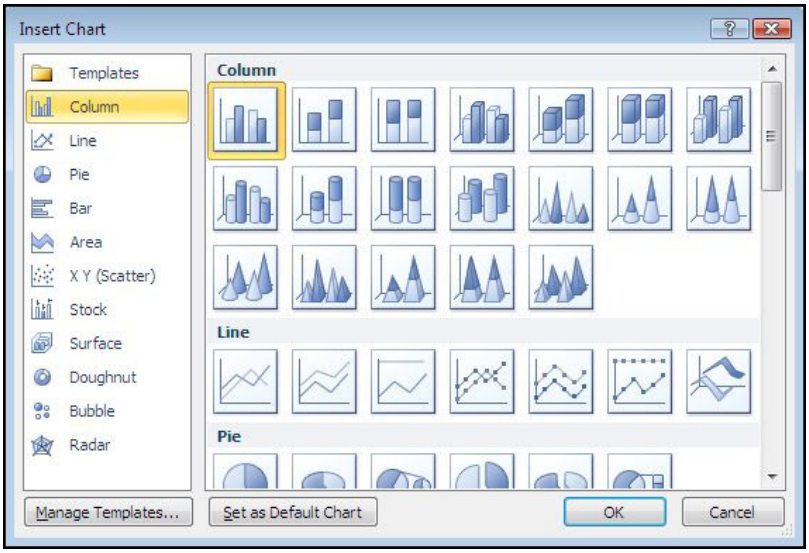
If you are creating a PivotChart report, an associated PivotTable report is created directly underneath the PivotChart report for the location that you enter. This PivotTable report must be in the same workbook as the PivotChart report. If you specify a location in another workbook, the PivotChart report will also be created in that workbook.

- *You can use any chart type except XY(scatter), bubble or stock.*

To Create A PivotChartReport From An Existing PivotTableReport

Mouse

1. From an existing PivotTableClick the **PIVOTCHART** Button in the **TOOLS** group of the **PIVOTTABLE TOOLS, OPTIONS** ribbon
2. Choose a chart type from the dialog box that appears



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3. Click **OK**

- *The chart will appear by default as an embedded object on your sheet.*

OR

1. On the **INSERT**ribbon, in the **CHARTS** group, click a chart type.
2. Select a sub chart type

- *The chart will appear by default as an embedded object on your sheet.*

OR

3. Click in PivotTable and press the **F11** key

- *Your chart will be created using the default chart type. And will be on a sheet on its own.*

Make PivotChart Static

The PivotTable report that supplies the source data to the PivotChart report. is created automatically when you create a new PivotChart report. When you change the layout of either report, theyboth change.

Find the associated PivotTable report that has the same name as the PivotChart report by doing the following:

Convert a PivotChart report to a static chart

Mouse

1. Click the PivotChart report to find the associated PivotTable report name, In the **DATA** group, on the **Design**ribbon, click **SELECT DATA** to display the **EDIT DATA SOURCE** dialog box, and then note the associated PivotTable name, which is the text that follows the (!) exclamation point, in the Chart data range text box and then click **OK**.
2. To identify the associated PivotTable report, click each PivotTable report in the workbook, and then on the **OPTIONS**ribbon, in the **PIVOTTABLE** group, click **OPTIONS** until you find the same name in the **NAME** text box. then Click **OK**.
3. On the **OPTIONS**tab, **Actions** group, click **SELECT**, then click **ENTIRE PIVOTTABLE**. Press **DELETE**.
4. The chart is now static and not associated with the PivotTable.

Create A Static Chart From The Data In A PivotTable Report

This procedure creates a regular, noninteractive chart rather than a PivotChart report (PivotChart report: A chart that provides interactive analysis of data, like a PivotTable report. You can change views of data, see different levels of detail or reorganize the chart layout by dragging fields and by showing or hiding items in fields.).

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To create static chart from data

Mouse

5. Select the data in the PivotTable report that you want to use in your chart. To include field buttons and data in the first row and column of the report, start dragging from the lower-right corner of the data that you're selecting.

- *A field button is a Button that identifies a field in a PivotTable or PivotChart report. You can drag the field buttons to change the layout of the report, or click the arrows next to the buttons to change the level of detail displayed in the report.*

6. On the **HOME**ribbon, in the **CLIPBOARD** group, click **COPY** .
7. Click a blank cell outside of the PivotTable report.
8. On the **HOME**ribbon, in the **CLIPBOARD** group, click the arrow next to **PASTE**, and then click **PASTE SPECIAL**.
9. Click **VALUES**, and then click **OK**.
10. Select the data including Headings
11. On the **INSERT**ribbon, in the **CHARTS** group, Select a chart type.

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Delete A PivotTable Or PivotChart Report

To Delete a PivotTable report

Mouse

1. Click the PivotTable report.
2. On the **OPTIONS**ribbon, in the **ACTIONS** group, click **SELECT**, and then click **ENTIRE PIVOTTABLE**.
3. Press **DELETE**.

- *Deleting the associated PivotTable reportfor a PivotChart report creates a static chart that you can no longer change.*
- ***AN ASSOCIATED PIVOTTABLE REPORT:*** *The PivotTable report that supplies the source data to the PivotChart report. It is created automatically when you create a new PivotChart report. When you change the layout of either report, the other also changes.*

To Delete a PivotChart report

Mouse

1. Select the **PIVOTCHART** report.
2. Press **DELETE**.

- *Deleting the PivotChart report does not automatically delete the associated PivotTable report.*

Create Layout For PivotTables

Once the PivotTable has been created a layout has to be created to view your data in the empty PivotTable we do this through the PivotTable Field list which appears in a pane to the right of your PivotTable

- *An **OPTION** button will allow you to change the way your PivotTable field list looks*

To create a layout

Mouse

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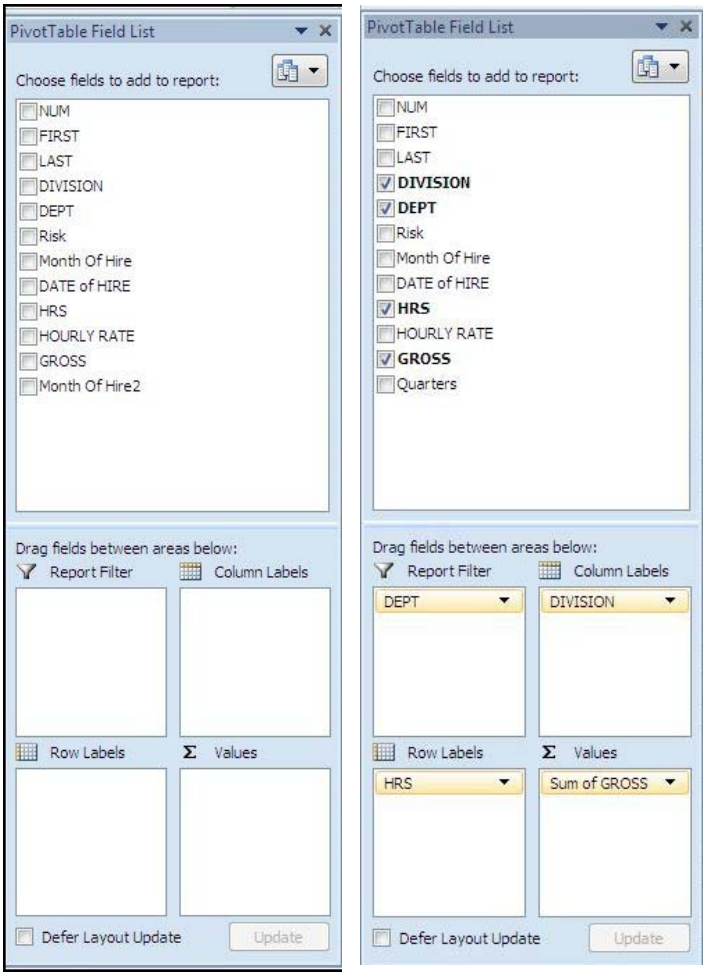

1. Drag and drop the fields from the fields section at the top to the bottom areas of the Pane
2. If **MONTH OF HIRE** is used as a row label the PivotTable will look at your data and pick out the unique values to make up the row headings within your report.
3. Choose a field for the column labels
4. Choose a field you wish to use as your values.

- *Use the **DEFER LAYOUT UPDATE** checkbox to stop the automatic update of the layout of your table if you have many fields and filters to arrange*
- *Numerical data will use **SUM** as the default method of calculating your data. If Textual it will use **COUNT** as default. You may use more than one field in any area but it is important to place them correctly. You may drag them around as much as you wish until your report looks as you wish it to look.*

5. You may filter on one or more fields if you wish. To do this drag a field to the **REPORT FILTER** box

- *Any of these sections can be filtered.*

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A	B	C	D	E	F
Sum of GROSS	Column Labels				
Row Labels	Australia	Canada	Germany	Great Britain	Grand Total
15.5	582.8				582.8
25		426		639	1065
29.5			1712.475		1712.475
32		528		456	984
35	1263.5	847		4224.5	6335
35.5		944.3	2218.75	1416.45	4579.5
38		1178		1767	2945
40	9078	2360	8268.8	7302.4	27009.2
42		703.5	2362.5		3066
Grand Total	**10924.3**	**6986.8**	**14562.525**	**15805.35**	**48278.975**

Modifying A Pivottable

- *All of the following are options for modifying your PivotTable*
- *Adding or deleting fields*
- *filtering and sorting*
- *Format the colour scheme*
- *Changing how the pivot chart calculates*
- *Using slicers*

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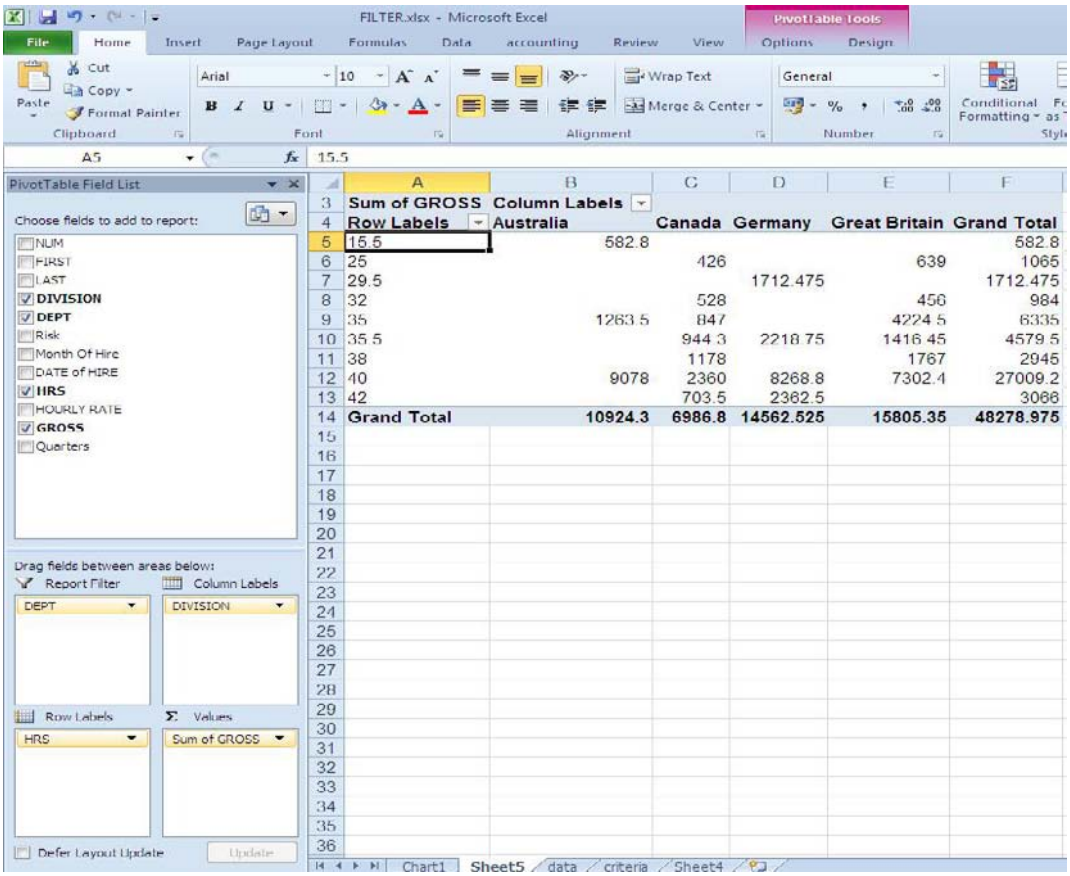

To Add or delete fields:

Mouse

1. Drag and drop the fields between the various areas and the **FIELD LIST** section field info will disappear or appear in different locations.
2. Dragging a field from one of the **LAYOUT AREAS** to the field list will remove that data from the report.(this will not change the data in your Data list merely leave it absent from the report.

Sort A PivotTable

To sort a report:

Mouse

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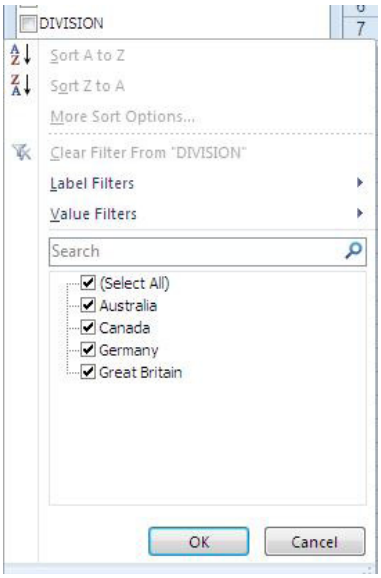

1. Move your mouse over a field that is ticked in the **FIELD LIST** section
2. Click on the drop down arrow to the right of the selected field
3. Click on **SORT A-Z** OR **Z-A** to Sort your data

OR

1. Instead of point 3 above Click on **MORE SORT OPTIONS**
2. The SORTdialog appears.
3. By default the setting is MANUAL (you may drag labels on your report to be in any order you wish).
4. **MAKE AN ASCENDING OR DESCENDING CHOICE AND BY WHAT FIELD (THIS MAY BE THE FIELD YOU ORIGINALLY STARTED THIS PROCESS FROM OR THE VALUE FIELD (E.G. SUM OF GROSS)**
5. Click OK.

OR

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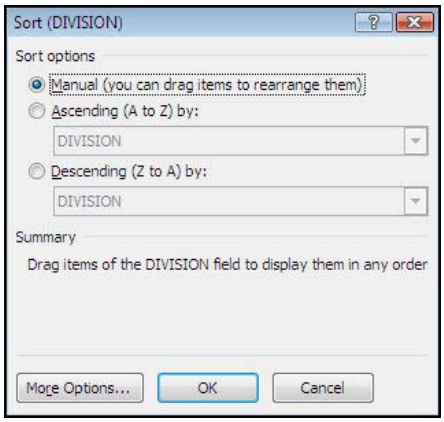

1. click on **MORE OPTIONS**
2. The **MORE SORT OPTIONS** dialog appears

- *By default the report will sorted each time you update the report. If this box is unticked then you are allowed to sort by a specific **FIRST KEY SORT ORDER** as when we created custom sort orders previously. (see following pictures.)*

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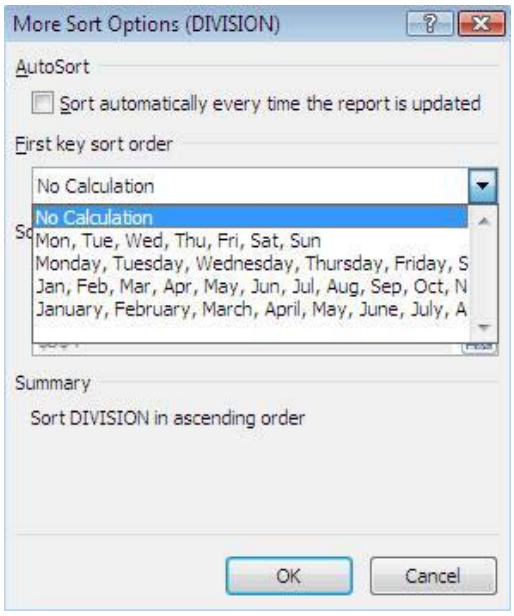
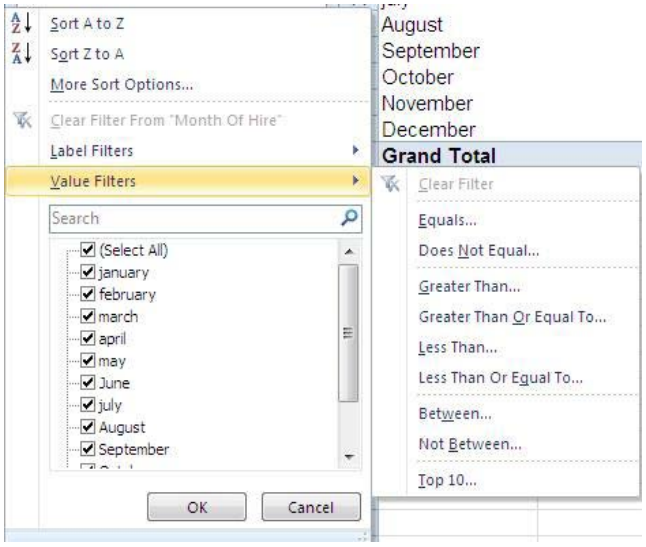
3. Make your sort choice
4. Click **OK** to return the **SORT** dialog and then **OK** to apply your sort.


More Sort Options (DIVISION)
AutoSort
Sort automatically every time the report is updated
First key sort order
No Calculation
No Calculation
Mon, Tue, Wed, Thu, Fri, Sat, Sun
Monday, Tuesday, Wednesday, Thursday, Friday, S
Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, N
January, February, March, April, May, June, July, A
Summary
Sort DIVISION in ascending order
OK
Cancel

Filter A PivotTable

Instead of filtering your data **BEFORE** making a PivotTable do it directly in the PivotTable itself Criteria and filtering covered earlier rules apply here to a large degree.



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To filter a report

Mouse

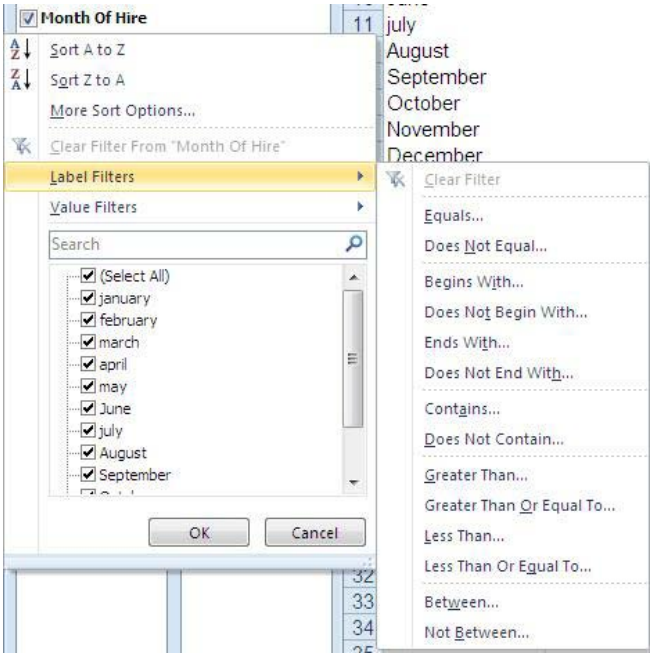
1. Move your mouse to **LABEL** OR **VALUE FILTERS** to see certain options to filter out your data.

Label Filter (Month Of Hire)
Show items for which the label
equals
Use ? to represent any single character
Use * to represent any series of characters
OK
Cancel

2. Choose the parameter such as equals or does not equal etc.

Label Filter (Month Of Hire)
Show items for which the label
does not equal
Use ? to represent any single character
Use * to represent any series of characters
OK
Cancel

3. Type in the value (or values) you will compare the condition against andClick **OK**



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Value And Label Filters

You may decide to filter your data more thoroughly there are two kinds of filters

- *Label filters will remove labels based on criteria rather than the tickboxes just discussed.*
- *Value filters will hide the data values and leave the labels showing. Both are completed the same way as Previously discussed in the filtering section.*

Some definitions

- ***OLAP CUBE:*** *An OLAP data structure. A cube contains dimensions, like Country/Region/City, and data fields, like Sales Amount. Dimensions organize types of data into hierarchies with levels of detail, and data fields measure quantities.*
- ***QUERY****: In Query or Access, a means of finding the records that answer a particular question you ask about the data stored in a database.*

Managing Pivottables

Refresh A PivotTable With Internal Data

- *When data is changed in the PivotTable source list, the PivotTable does not automatically recalculate.*

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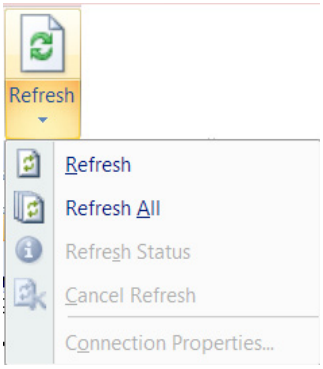
To refresh a PivotTable:

Mouse



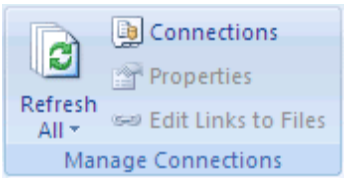
1. Click in the PivotTable.
2. ChoosE **REFRESH DATA** in the **DATA** group on the **OPTIONS** ribbon.
3. Choose to **REFRESH ALL** or just **REFRESH**
4. The data is is now refreshed and updated new information, field names and changed data is now displayed

- ***REFRESH*** *will refresh just the report you are clicked on.* ***REFRESH ALL*** *will refresh all reports in the workbook.*

External Data Refresh

Automatically Refresh Data When A Workbook Is Opened

You can refresh an external data range automatically when you open the workbook, and optionally save the workbook without saving the external data, so that the workbook file size is reduced.



To automatically refresh data

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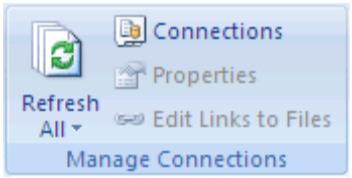
Mouse

1. Click a cell in the external data range.
2. On the **DATA**ribbon, in the **MANAGECONNECTIONS**group, click the arrow next to **REFRESH**, and then click **CONNECTIONPROPERTIES**.
3. Click the **Usage** tab andSelect the **REFRESH DATA ON FILE OPEN** check box.
4. If you want to save the workbook with the query definition but without the external data, select the **REMOVE EXTERNAL DATA FROM QUERY TABLE BEFORE SAVING WORKSHEET** check box.

To refresh data when the workbook is opened for a PivotTable report, you can also use the Refresh data when opening the file check box under the PivotTable Data section on the Data tab of the PivotTable Options dialog box.

Automatically Refresh Data At Regular Time Intervals



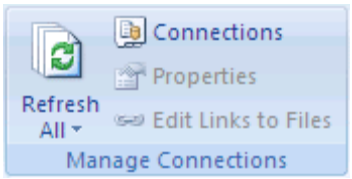
To refresh at Time intervals

Mouse

5. Click a cell in the external data range.
6. On the **DATA**ribbon, in the **CONNECTIONS**group, click the arrow next to **REFRESH**, and then click **CONNECTION PROPERTIES**.
7. Click the **USAGE** tab and Select the **REFRESH EVERY** check box, and then enter the number of minutes between each refresh operation.

Require A Password To Refresh An External Data Range

Stored passwords are not encrypted and not recommended. If your data source requires a passwordto connect to it, you can require that the password is entered before the external data range can be refreshed. This procedure does not apply to data retrieved from a text file (*.txt) or a Web query (*.iqy).



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To set a password.

Mouse

8. Click a cell in the external data range.
9. On the **DATA**ribbon, in the **CONNECTIONS**group, click the arrow next to **REFRESH**, and then click **CONNECTION PROPERTIES.**
10. Click the **DEFINITION** tab and clear the **SAVE PASSWORD** check box.

Excel prompts for the password only the first time that the external data range is refreshed in each Excel session. The next time that you start Excel, you will be prompted for the password again if you open the workbook that contains the query and attempt a refresh operation.

Grouping PivotTable Items

- *Data can be summarised into higher level categories by grouping items within PivotTable fields. Depending on the data in the field there are three ways to group items:*
- *Group selected items into specified categories.*
- *Automatically group numeric items*
- *Automatically group dates and times*

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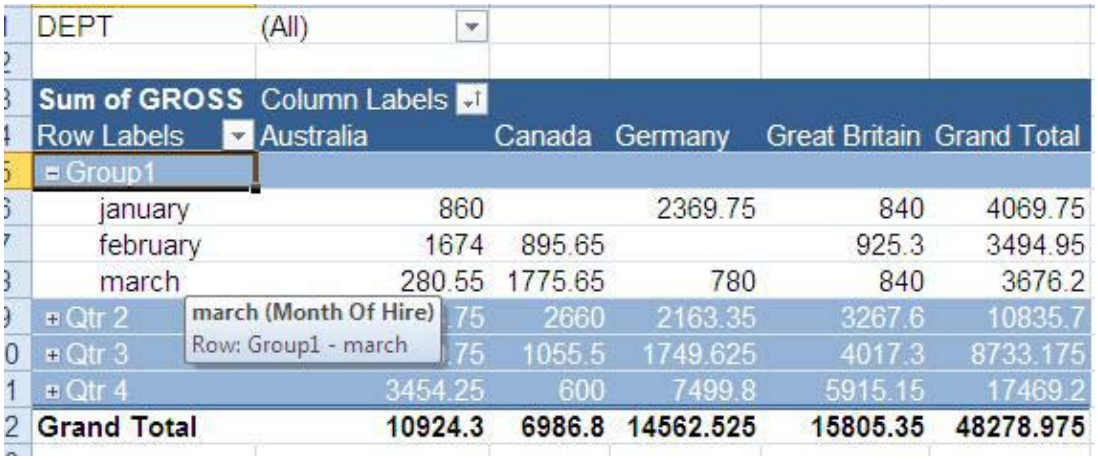
To group selected items:

Mouse

1. Select the items to group. Select adjacent items by clicking and dragging or non-adjacent items by selecting each item whilst holding [**CTRL**].
2. Choose **GROUP** from the **OUTLINE** group on the **DATA** ribbon.
3. Groups are created automatically in the example shown but if non adjacent fields are chosen only one group will be created:



4. If automatic grouping did not create all the required groups Repeat procedure until grouping is complete
5. Click on a group name (E.G. **GROUP1**) Then type in the name you wish to call this group in the example above the months have been grouped and named as quarters
6. The + and – buttons in front of the group names allow the collapse and expansion of the groups to see the data for the subgroup.

- *You may even group several groups together*

To rename a group.

Mouse

1. The row labels may now have a duplicate field name with a number following the name. If automatic creation of groups did not occur. Click on the drop down arrow to the right of the field name. and select **FIELD SETTINGS**.

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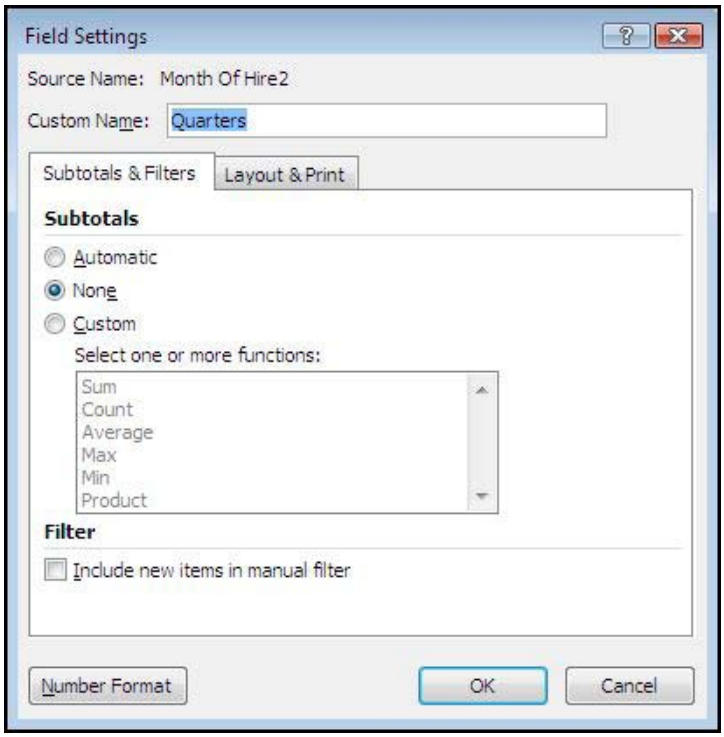
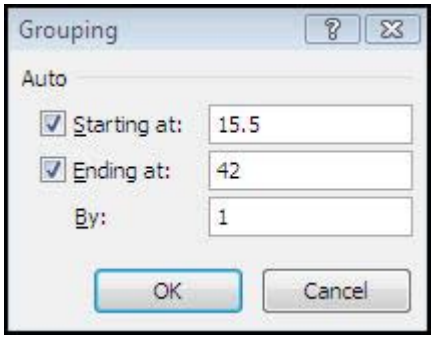
2. the following dialog will appear
3. Enter a new **CUSTOM NAME** that would best describe the group. Such as **QUARTERS**.
4. Click **OK**
5. The field has changed names not just within the Row label area but also in the field list section where it can be used within this report until it is ungrouped.



To group numerically

Mouse



1. Select a single item.
2. Choose **GROUP FIELD** From the **OUTLINE** group on the **DATA** ribbon

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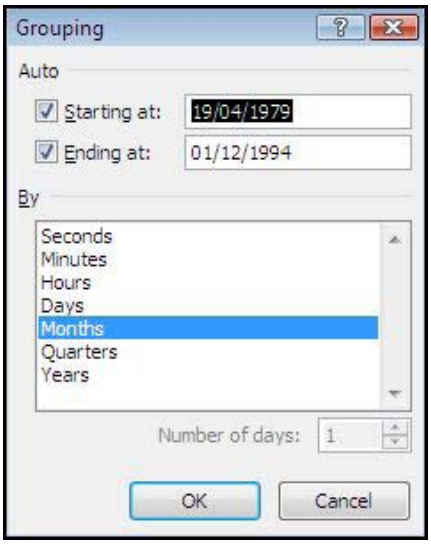
3. Excel displays a dialog box in which to enter starting, ending and interval values. Enter appropriate values
4. Click **OK**.

To group a date or time in a range:

Mouse



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1. Select a single item.
2. Choose **GROUP FIELD** from the **OUTLINE** group on the **DATA** ribbon
3. Excel displays a dialog box in which to enter starting, ending and interval values.
4. Enter appropriate values and click **OK**.

If you are experiencing problems analysing list data check the following:-

- *Your list is correctly set up with the first row containing the column labels identifying data in each of the columns and no blank rows between the headings and the first row of data.*
- *Your column headings are not ambiguous - i.e. they cannot be confused with function names or range names.*
- *Your column headings are formatted to make them stand out from the data.*
- *Your column headings ideally should not contain spaces - you can remove the spaces completely or replace them with an underscore (_) character.*
- *Your criteria range should only contain a row of headings and blank rows below. The headings must exactly match the headings at the top of your list.*
- *Problems sometimes occur if the criteria range looks blank but perhaps has a space in it.*

Formatting A Pivottable

After you have added the fields, displayed the appropriate level of details, created calculations, and sorted, filtered, and grouped data the way that you want in a PivotTable report, you often want to enhance the layout and format of the report to improve readability and to make it more attractive. There are a number of ways to change the layout and format of a PivotTable report as described in the following sections.

You can manually format a cell or cell range in PivotTable report by right-clicking the cell or cell range, by clicking **FORMAT CELLS**, and by using the **FORMAT CELLs**dialog box. However, you cannot use the **MERGE CELLS** check box on the **ALIGNMENT**group in a PivotTable report.

- *You can also conditionally format a PivotTable report*

Styles

To apply a PivotTable style

Mouse

1. Click the PivotTable report.
2. On the **DESIGN**ribbon, in the **PIVOTTABLE STYLEs** group
3. Click a visible style, scroll through the gallery, or to see all of the available styles, click the **MORE** button, at the bottom of the scroll bar.

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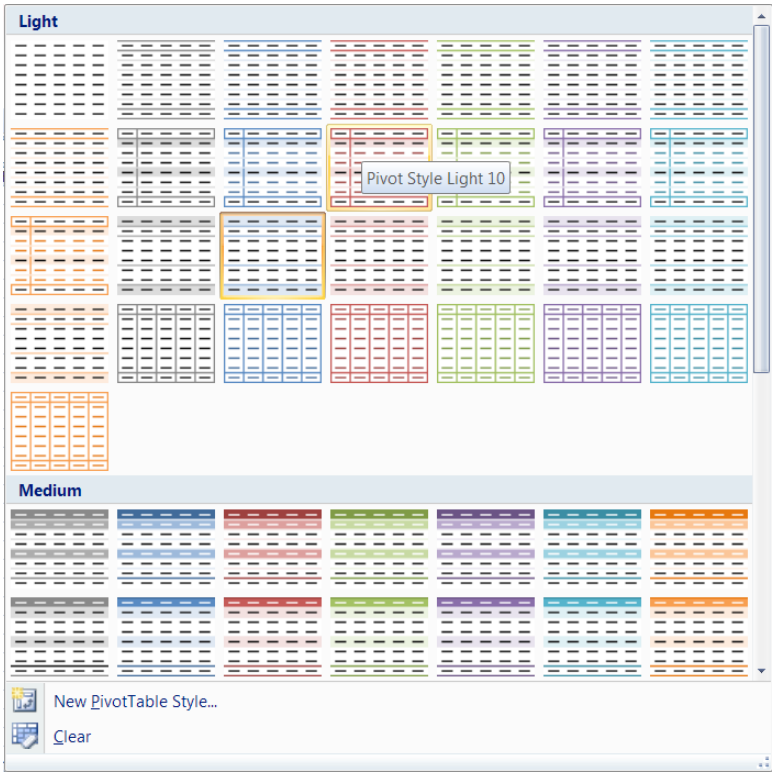
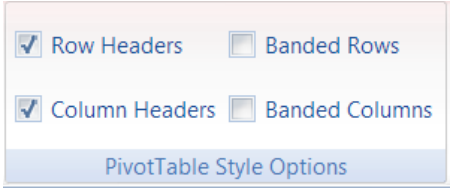


OR

1. If you have displayed all of the available styles and you want to create your own custom PivotTable style, click **NEW PIVOTTABLE STYLE** at the bottom of the gallery to display the **NEW PIVOTTABLE STYLE** dialog box.

Banding



to apply Banding

Mouse

1. Click the PivotTable report.
2. On the **DESIGN**ribbon, in the **PIVOTTABLE STYLE OPTIONS** group, either:

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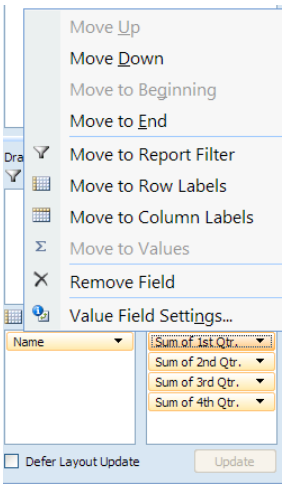
- *To alternate each row with a lighter and darker colour format, click **BANDED ROWS.***
- *To alternate each column with a lighter and darker colour format, click **BANDED COLUMNS**.*
- *To include row headers in the banding style, click **ROW HEADERS**.*
- *To include column headers in the banding style, click **COLUMN HEADERS**.*

To Change the number format for a field

Mouse



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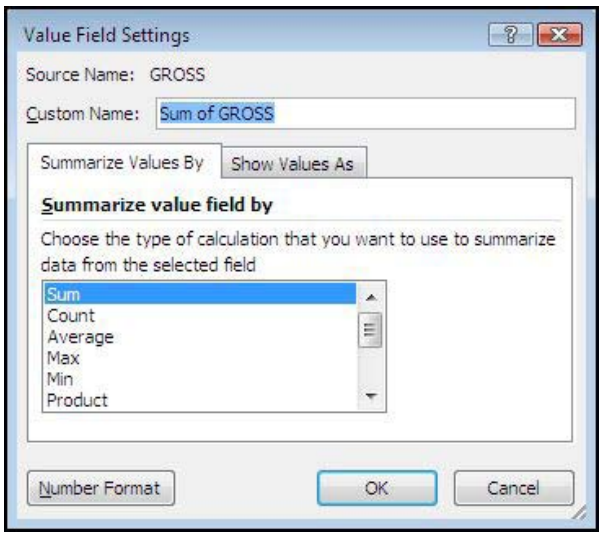
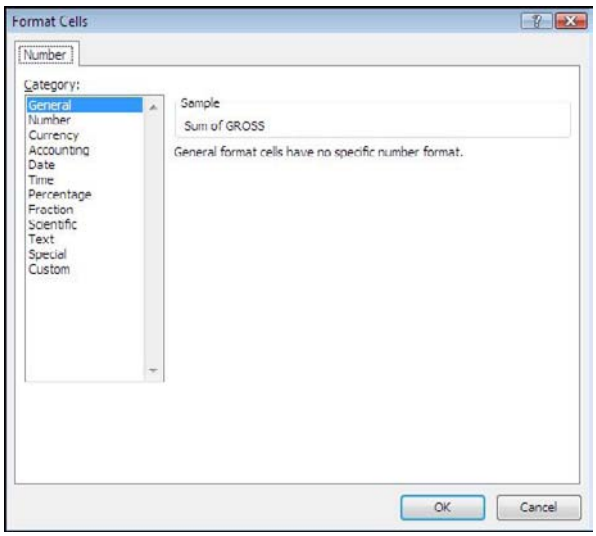
1. In the PivotTable report, select the field for which you want to change the number format.
2. On the **OPTIONS**ribbon in the **ACTIVE FIELD** group, click **FIELD SETTINGS**. The **FIELD SETTINGS** dialog box is displayed for labels and report filters, and the **VALUES FIELD SETTINGS** dialog box is displayed for values.
3. Click **NUMBER FORMAT** at the bottom of the dialog box. The **FORMAT CELLS** dialog box is displayed.
4. In the **CATEGORY** list, click the format category that you want.
5. Select the options that you want for the format, and then click **OK** twice.





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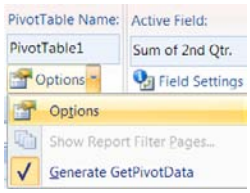
Preserve or discard formatting

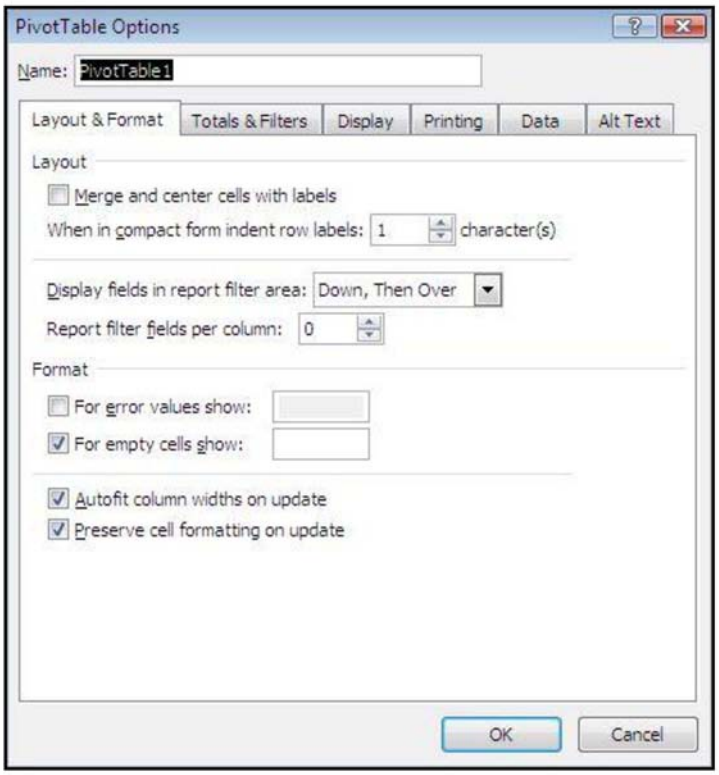
Mouse



1. Click the PivotTable report.
2. On the **OPTIONS**ribbon, in the **PIVOTTABLE** group, click **OPTIONS**. The**PIVOTTABLEOPTIONS**dialog box is displayed.
3. Click the **LAYOUT & FORMAT**TAB, in and look at the **FORMAT** section
4. To save the PivotTable report layout and format so that it is used each time that you perform an operation on the PivotTable, select the **PRESERVE CELL FORMATTING ON UPDATE** check box.

OR

5. To discard the PivotTable report layout and format and resort to the default layout and format each time that you perform an operation on the PivotTable, clear thE **PRESERVE CELL FORMATTING ON UPDATE** check box.



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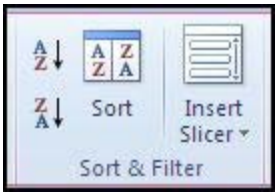
Slicers



Slicers are a new feature in 2010 they are a new way to quickly slice through your PivotTable to a specific set of data and quickly view different sections of the data. Although the filtering we have done so far shows the data you want. Slicers are easier and quicker to use.

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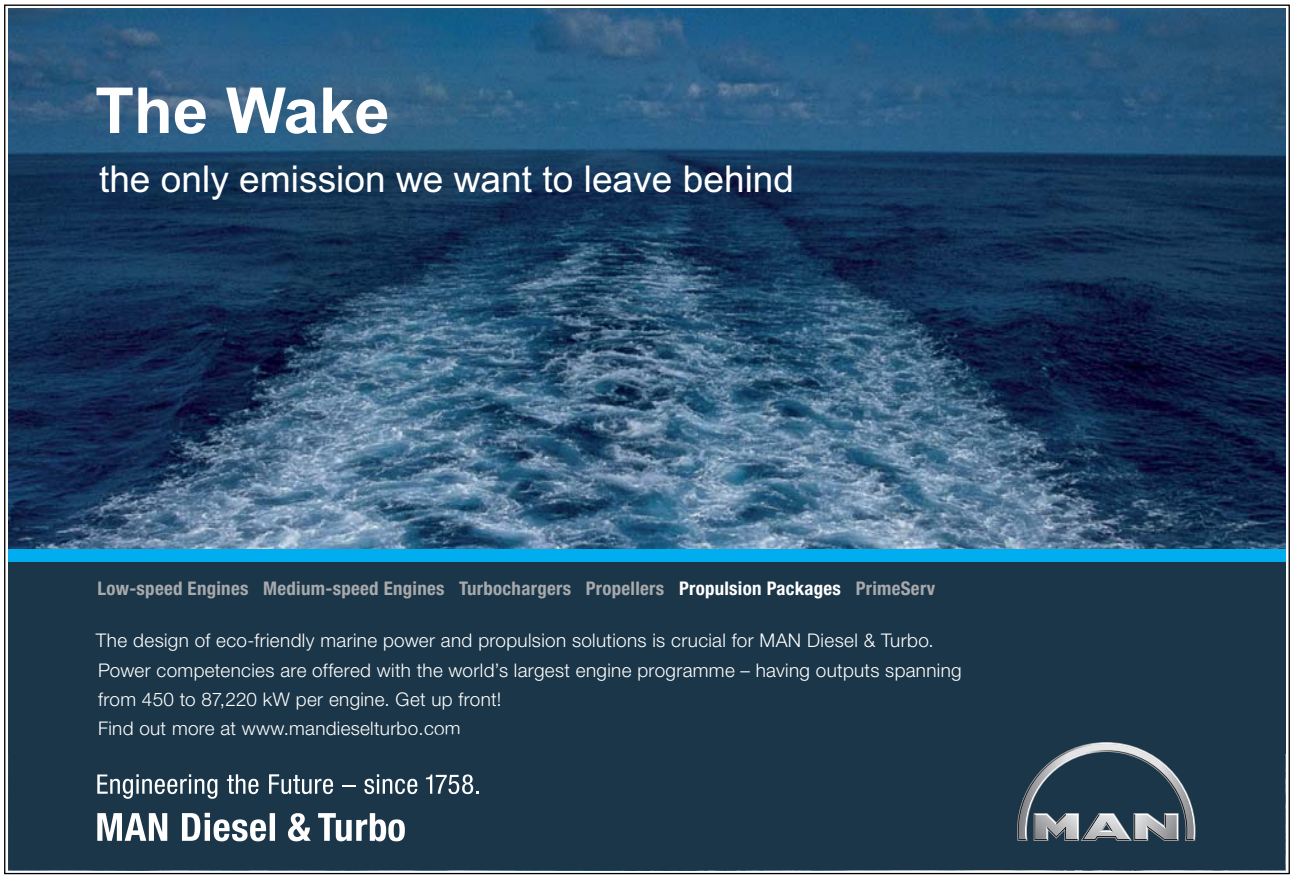
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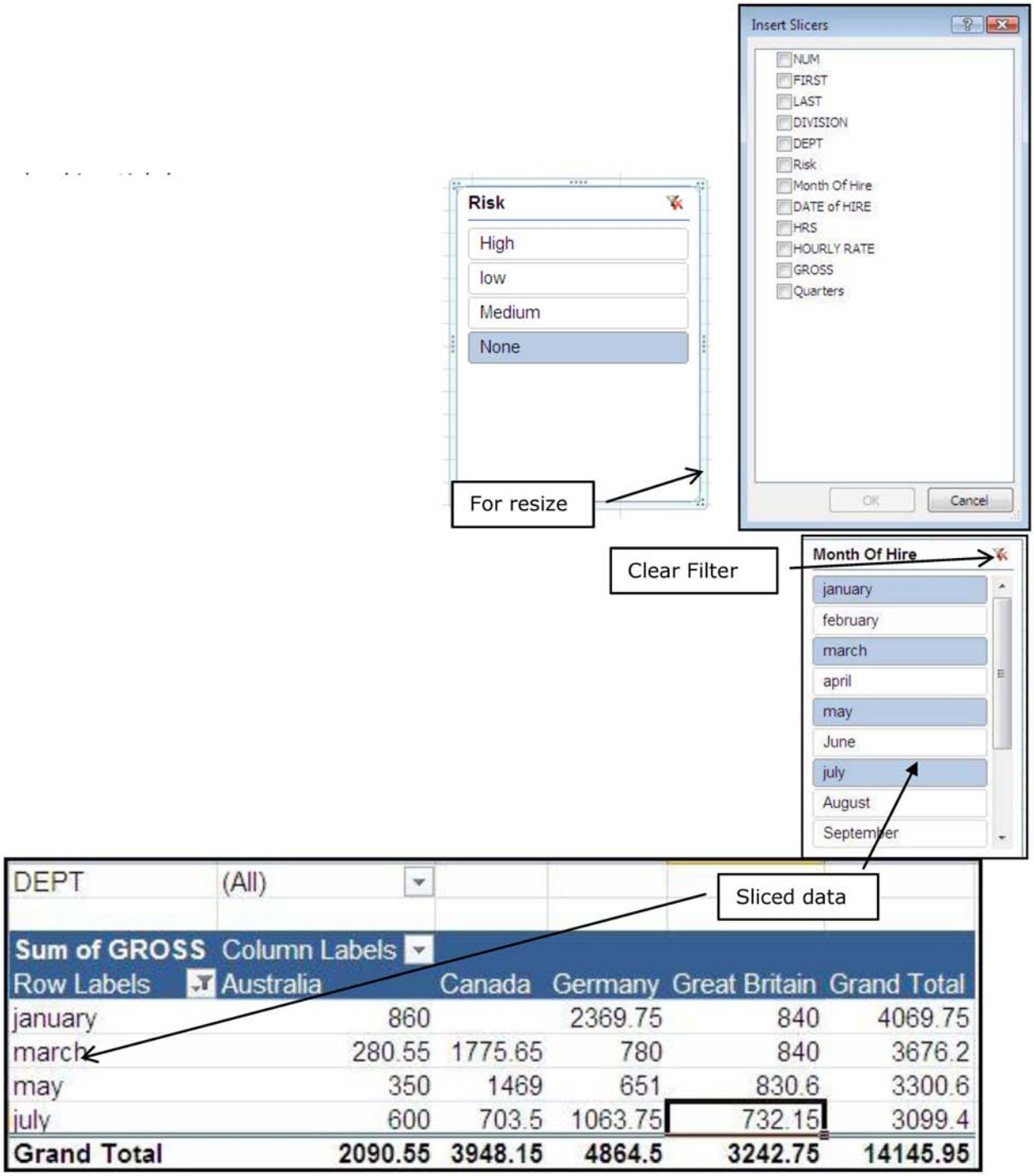
To create a slicer

Mouse



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1. Click within your PivotTable
2. Go to the **SORT AND FILTEr** group on the **options** ribbon for **PIVOTTABLE TOOLS** and click on **INSERT SLICER**
3. Choose one or more fields you would like a slicer for from the list by checking tick boxes.

- *The field or fields you select do not have to be part of the PivotTable layout because any of the fields within your data can be filtered or sliced.*

4. When one or more are selected click on **OK**
5. A slicer appears as a floating dialog on your worksheet(or several if you selected more than one field) that can be dragged around or resized by using the resize handles

To use a slicer

Mouse

1. Click on a value in the slicer and your data will be automatically filtered by that value.
2. You may select more than one value in your slicer by using thE **CTRL** key and clicking on the desired values in the slicer.
3. You may clear all selections by clicking on the **CLEAR FILTER** button in the top right hand corner of the slicer dialog.

To delete a slicer

Mouse

1. Right click anywhere on the slicer,
2. Choose **REMOVE**, the field name will be mentioned

Slicer Options

Various options can be set for slicers when a slicer is selected a contextual ribbon gives many options.

To access slicer options

Mouse

1. Click on a slicer
2. The contextual ribbon should show, with various options for the slicer the ribbon as you can see is called **SLICER TOOLS, OPTIONS**.

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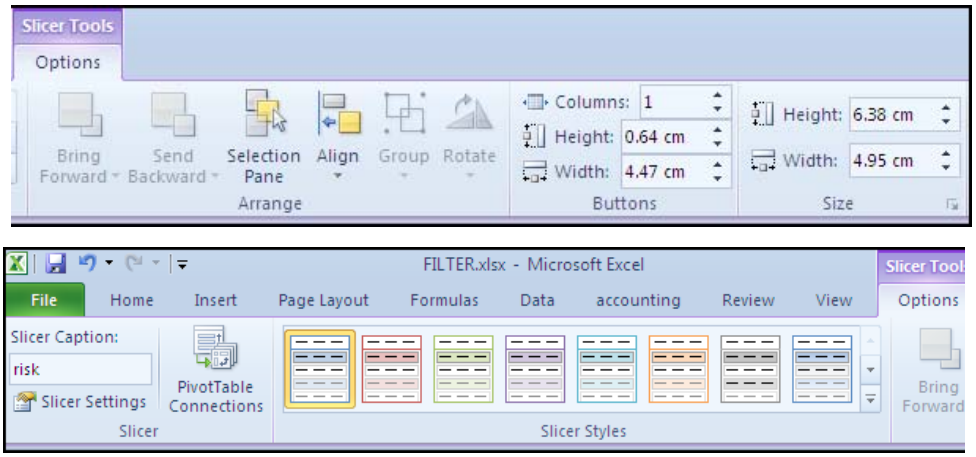

Make A Slicer Available For Use In Another Pivot Table

You can share a slicer with another PivotTable by connecting it to that PivotTable. You can also insert a slicer from another PivotTable by connecting to that PivotTable.

Make a slicer available for use in another PivotTable

Create a connection to the PivotTable that contains the slicer that you want to share by doing the following:

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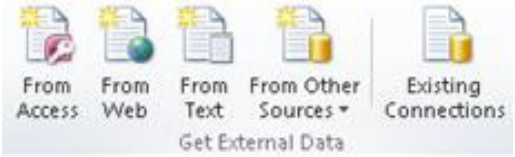
Mouse

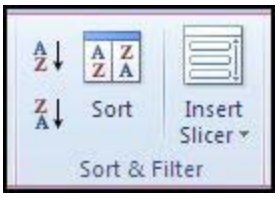
1. On thE **DATA** tab, in the **GET EXTERNAL DATA** group, click **EXISTING CONNECTIONS.**



2. In the **EXISTING CONNECTIONS** dialog box, in the **SHOW** box, make sure that **ALL CONNECTIONS** is selected.

- *If you do not see the connection that you want, you can create a connection. Click BROWSE FOR MORE, and then in the SELECT DATA SOURCE dialog box, click New Source to start the Data Connection Wizard so that you can select the data source that you want to connect to.*

3. Select the connection that you want, and then click **Open**.
4. In the **IMPORT DATA** dialog box, under **SELECT HOW YOU WANT TO VIEW THIS DATA IN YOUR WORKBOOK**, click **PIVOTTABLE REPORT.**
5. Click anywhere in the PivotTable report for which you want to insert a slicer from another PivotTable.



- *This displays the PIVOTTABLE Tools, adding an OPTIONS and a DESIGN tab.*

6. On the **OPTIONS** tab, in the **SORT & FILTER** group, click thE **INSERTSLICER** arrow, and then click **SLICER CONNECTIONS**.
7. In the **SLICER CONNECTIONS** dialog box, select the check box of the slicers that you want to use.
8. Click **OK**.

- *A slicer is displayed for every check box that you selected.*

9. In each slicer, click the items on which you want to filter.

- *To select more than one item, hold down CTRL, and then click the items that you want to filter.*

All PivotTables that share the slicer will instantly display the same filtering state.

Share A Slicer By Connecting To Another PivotTable

You can share a slicer with another PivotTable by connecting it to that PivotTable. You can also insert a slicer from another PivotTable by connecting to that PivotTable.

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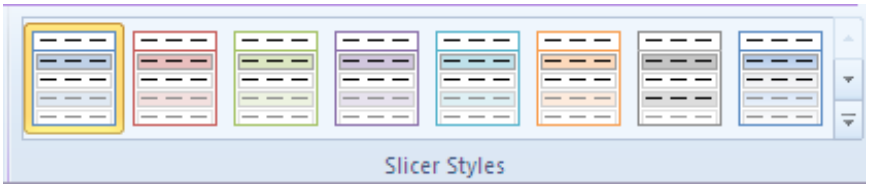
Make a slicer available for use in another PivotTable

Mouse

1. Click the slicer that you want to share in another PivotTable.
- *This displays the **SLICER TOOLS**, adding an **OPTIONS** tab.*
2. On the **OPTIONS** tab, in the **SLICER** group, click **PIVOTTABLE CONNECTIONS**.
3. In the **PIVOTTABLE CONNECTIONS** dialog box, select the check box of the PivotTables in which you want the slicer to be available.

Format A Slicer

1. Click the slicer that you want to format.
2. This displays the **SLICER TOOLS**, adding an **OPTIONS** tab.
3. On the **OPTIONS** tab, in the **SLICER STYLES** group, move your mouse over a style to see a preview of it applied to your PivotTable.



4. To see all available styles, click the **MORE**button .

1. When you find the style you like click to apply.

To set slicer settings

Mouse

1. Right click anywhere on the slicer,
2. Choose **SLICER SETTINGS** from the bottom of the menu
3. The following dialog will appear

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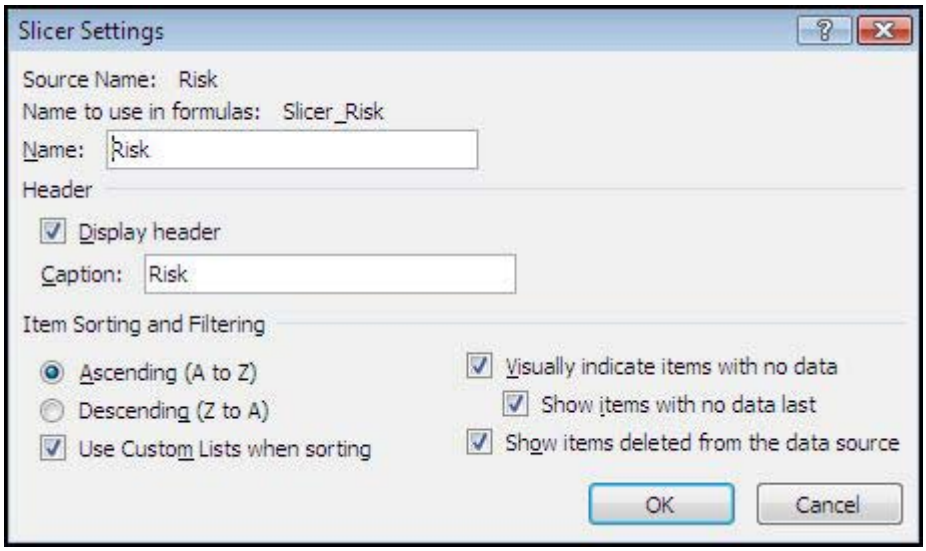

4. You now have the ability to do several things

- *You can change the name of the slicer(this will only matter in sharing slicers as a data connection to it.*
- *Change the caption this is the heading which appears at the top of the caption*
- *Sort the values in the slicer*
- *Turn the header on or off*
- *Check boxes to toggle viewing empty or deleted data.*

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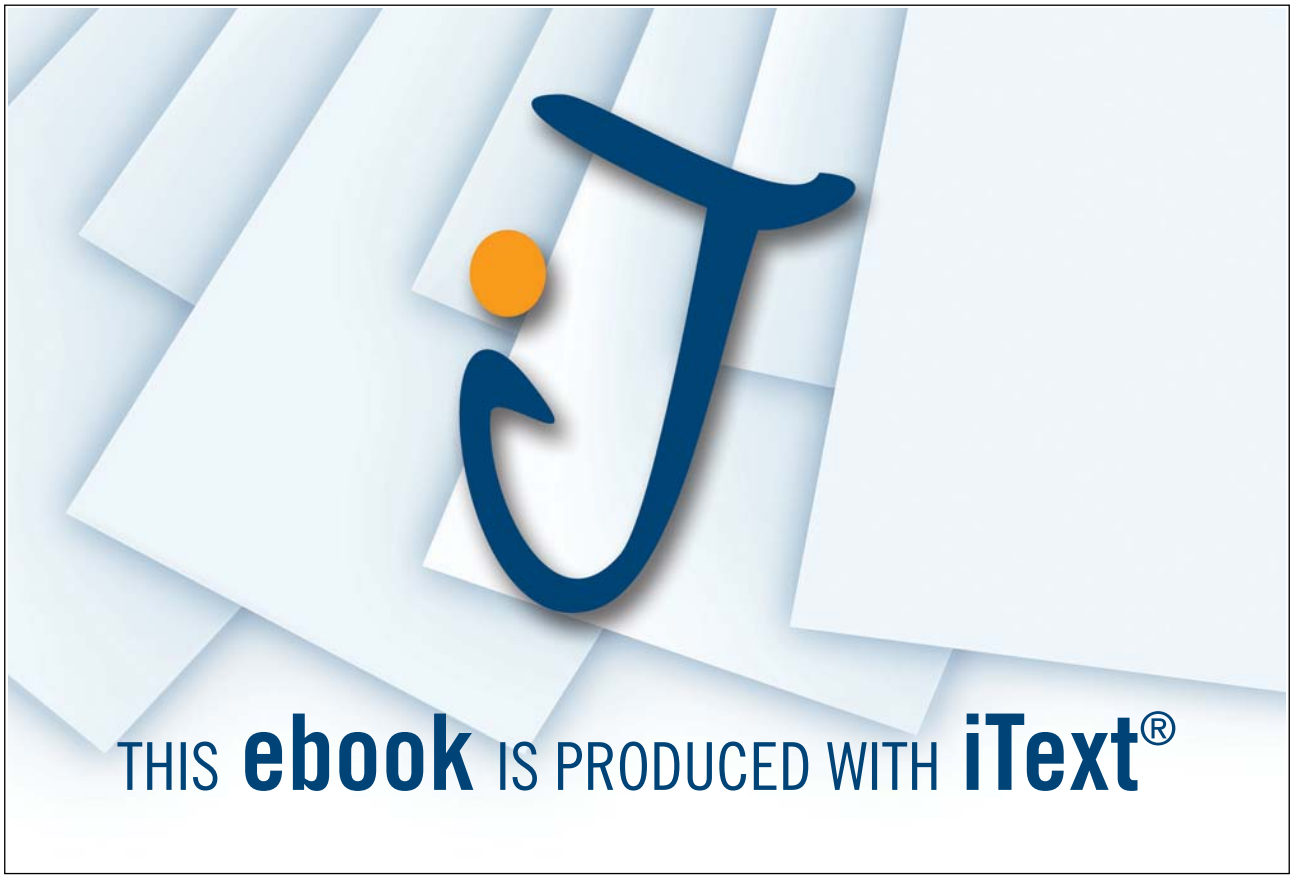

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Standalone Slicer

To create a standalone slicer

Mouse

1. On the **INSERT** tab, in the **FILTER** group, click **SLICER**.
2. In the **EXISTINGCONNECTIONS** dialog box, in the **SHOW** box, do one of the following:

- *To display all connections, click ALL CONNECTIONS. This is selected by default.*
- *To display only the recently used list of connections, click CONNECTIONS IN THIS WORKBOOK.*
- *This list is created from connections that you have already defined, that you have created by using the SELECT DATA SOURCE dialog box of the DATA CONNECTION WIZARD, or that you have previously selected as a connection from this dialog box.*

3. To display only the connections that are available on your computer, click Connection files on this computer.

- *This list is created from the My Data Sources folder that is usually stored in the My Documents folder.*

4. To display only the connections that are available from a connection file that is accessed from the network, click **CONNECTION FILES ON THE NETWORK**.
5. In the **CHOOSE FIELDS** dialog box, click check box of the fields for which you want to create a slicer.
6. Click **OK**.
7. A slicer is created for every field that you selected

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4 Charts

Objectives

By the end of this section you will be able to:

- Create embedded charts
- Create separate page charts
- Change chart types and formats
- Add and remove chart data
- Add trend lines to charts
- Create picture charts

Introduction To Charting

One of the most impressive aspects of Excel is its charting ability. There are endless variations available, allowing you to produce a chart, edit and format it, include notes, arrows, titles and various other extras as desired. This manual will look at many of the issues involved in producing and formatting Excel charts.

Charts are based on data contained in Excel Worksheets. It is necessary to understand how Excel picks up the data to be used in a chart because the way in which the data is laid out will influence how the chart is presented.

Excel offers a wide range of types and formats from which you can choose when producing charts. However, the charts themselves can exist in different forms and it is important to understand the difference between them. The first form is an embedded chart, the second is a separate chart page.

Terminology

As a starting point, there are some terms used in charting which should be understood by you. The terms defined below relate to the example car sales worksheet and column chart which appear beneath the table:

Data Point	An individual figure on the spreadsheet which is reflected in the chart e.g. Fred's Orion sales figure
Data Series	A collection of related data points, e.g. all of Fred's figures, which will appear on a chart as markers (bars, for example) of the same colour
Legend	The "key" to the chart, identifying which patterns/colours relate to which data series
Marker	A bar, column, or slice of pie for example, representing a data point
Category	The category axis appears across the bottom of a graph (pie charts excepted) and the categories are listed here. Points within the different data series are grouped by category

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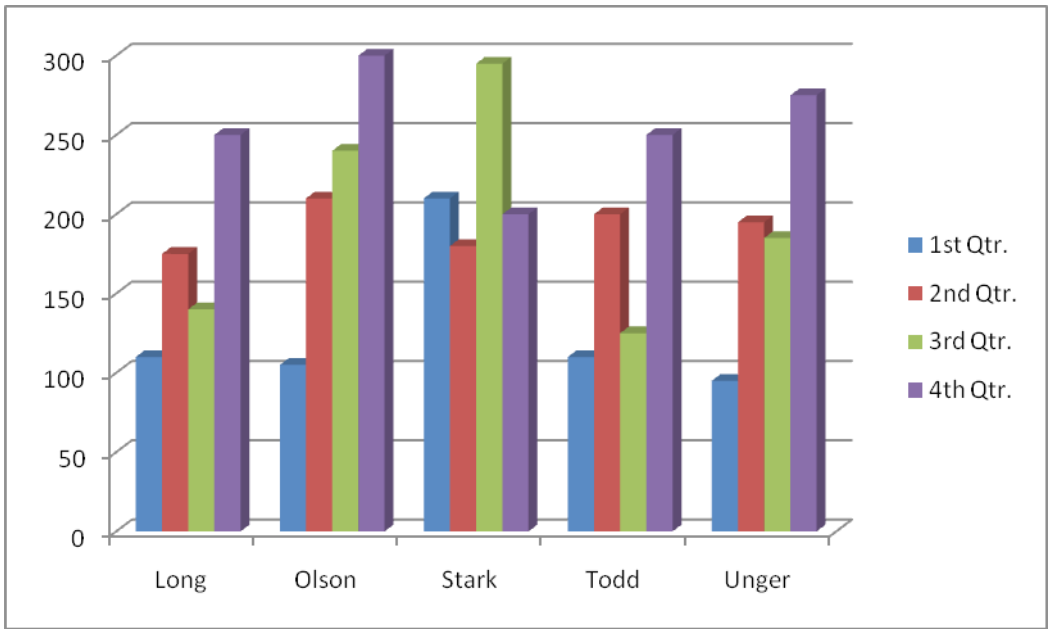

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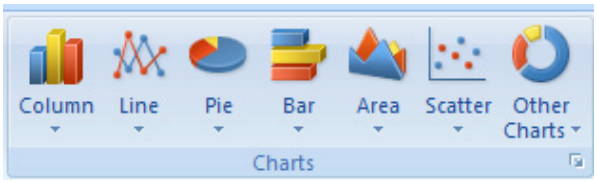
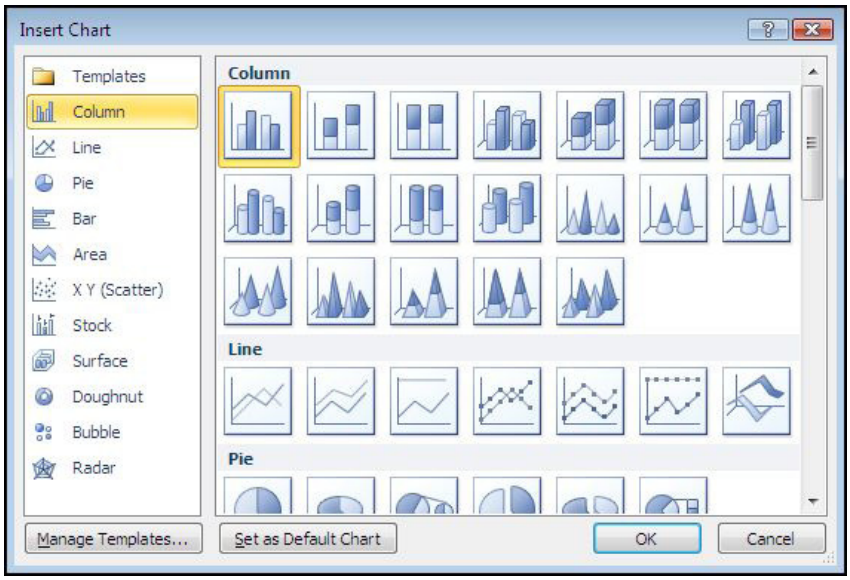
Creating Charts



Embedded Charts

An embedded chart appears on the worksheet where it was created. It is an embedded object, which does not normally appear in its own window, and has no separate existence apart from the worksheet. The chart is saved only when the worksheet file itself is saved, and will be printed with the worksheet in which it is embedded. You may choose to have an embedded or separate chart at any time.All charts whether embedded or separate are created from the **INSERT** ribbon in the **CHARTS** group.



Separate Chart Pages

A chart sheet, although linked to the worksheet whose figures it represents, exists as a separate page in a workbook. The F11 key is very useful for creating a default chart from selected data as a new sheet within the workbook

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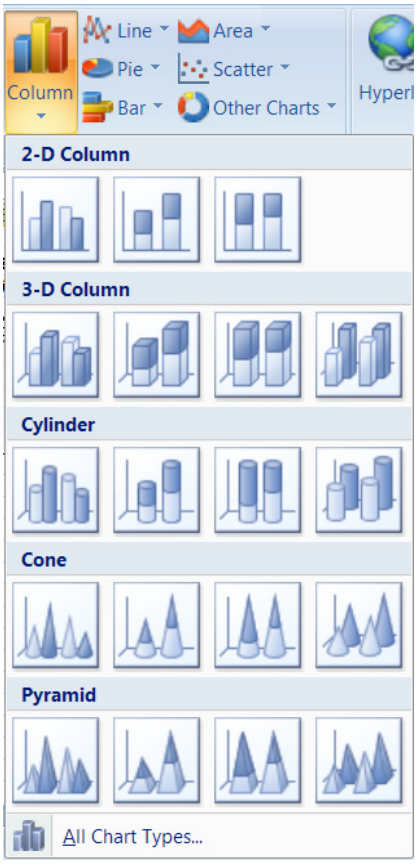
Some chart elements to be aware of.

Chart Element	Description
Titles	This is the area where you can specify the titles to have on the chart (i.e. X-axis "1998", Z-axis "GBP"
Axes	Here you specify whether you want a Y/Z axis and whether you are using timescales to plot your data
Gridlines	The gridline ribbon allows you to switch on and off horizontal and vertical gridlines
Legend	Use this ribbon to switch the legend on and off or reposition it
Data Labels	The Data Labels ribbon allows you to display the amount each point represents or display the label (i.e. in the example above, each cylinder would have Qtr1, Qtr2 displayed as appropriate at the top of each data marker)
Data Table	The Data Table ribbon will display a grid underneath the chart that will show the information that is being plotted.

Three Methods To Create Charts

To create a chart

Mouse



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1. Select data for chart.
2. Go to the **CHARTS** group on the**INSERT** ribbon. Select a chart type and click
3. The menu on the right appears.
4. Hovering your mouse over a chart type will bring up an explanation of that chart type
5. When you have chosen click once to select a chart type
6. The chart is now created based on the selected data as an embedded chart.

OR

Keyboard

1. Select Data for chart
2. Press the F11 Key
3. **Default chart will created as chart on a separate sheet.**

OR

Mouse

1. Select data for chart.
2. Click on the **DIALOG BOX LAUNCHER** on the **CHARTS** group on the **INSERT** ribbon.

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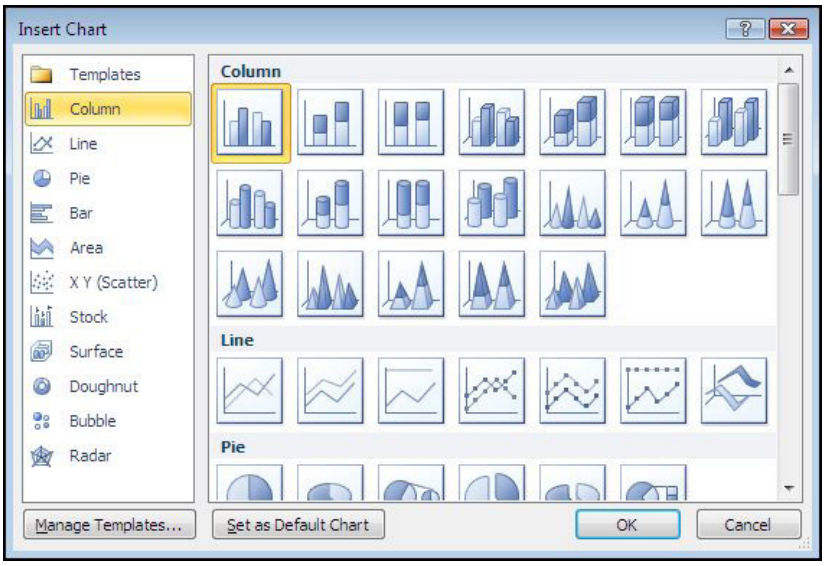


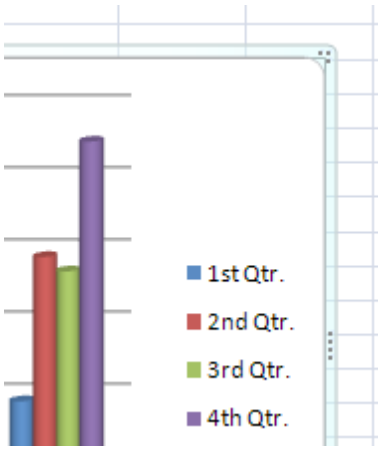
3. The following dialog will appear
4. Select a type from the left hand section and a sub type from the right hand section.
5. Click **OK** to create the chart.
6. This will be created as an embedded chart

Moving And Resizing Embedded Charts

Once the chart object has been created and stored as an embedded object, you can move and resize it.

To move an embedded chart:

Mouse



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1. Move mouse over the chart frame border your mouse cursor should have a four pointed black arrow
2. Click on the chart frame border and hold the mouse button down as you drag. Release the mouse when the chart is in the desired location.

To resize an embedded chart:

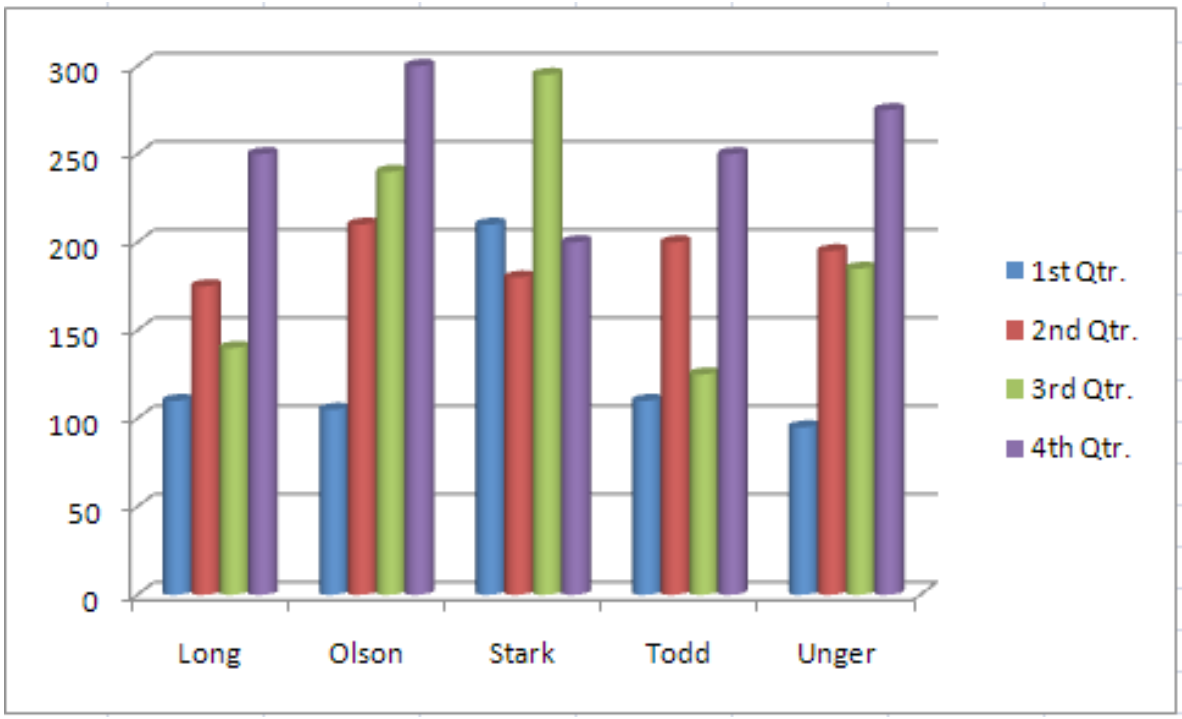
Mouse

1. Move your mouse over the dotted handles on the Chart frame border.
2. The mouse cursor should change to a double arrow.
3. Click and Drag up, down, left or right.

Hold down the [ALT] key if you wish the chart to resize by snapping to the cell gridlines

Data Layout

Depending on the "shape" of the selected data, Excel will assign categories and data series to either the rows or columns of information. Usually it will be assumed that there are more categories than data series, therefore, if there are more rows than columns of selected information, the data series will be based on columns, with the legend labels being picked up from the row across the top of the selected area and the category labels being picked up from the leftmost column:



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Last Year's Sales Figures *Australian Division*				
Name	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*
Long	110	175	140	250
Olson	105	210	240	300
Stark	210	180	295	200
Todd	110	200	125	250
Unger	95	195	185	275

If there are more columns than rows in the selected area, the data series will be based on rows, with the legend labels being picked up from the leftmost column and the category labels taken from the top row of the selected area:

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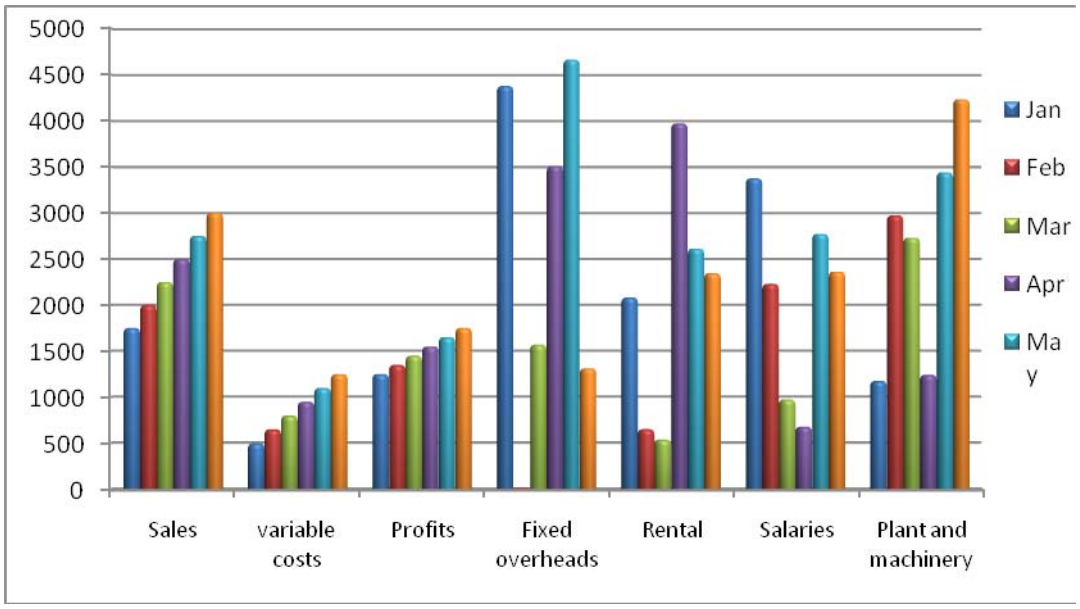
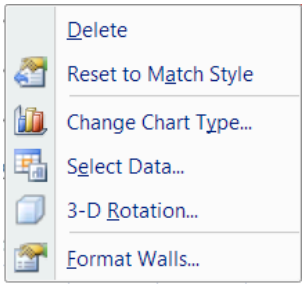


If the number of rows and columns is the same, Excel will opt for data series in rows. It is possible to override the choice made by Excel in how the data series and categories are decided. Details of this procedure will be found under the section on manipulating data.

	A	B	C	D	E	F	G
1	Steady Increase		Profits Figures				
2		Jan	Feb	Mar	Apr	May	Jun
3	Sales	1750	2000	2250	2500	2750	3000
4	variable costs	500	650	800	950	1100	1250
5	Profits	1250	1350	1450	1550	1650	1750
6	Fixed overheads	4376	18	1570	3508	4662	1313
7	Rental	2082	653	539	3969	2611	2345
8	Salaries	3374	2230	975	679	2772	2361
9	Plant and machinery	1176	2972	2730	1243	3439	4232

Shortcut Menu (Right Click)



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You may be familiar with the Shortcut menus associated with the selected cell(s) on the Excel worksheet. When working on a chart - embedded either on a worksheet or in its own window, clicking on the chart with the secondary mouse button will call up a Charting Shortcut menu.

The Shortcut menu will contain a selection of choices from some of the Standard Menu bar options mostly relating to the chart as an embedded object - almost like a graphic on the worksheet.

Chart Types

There are several different types of chart available within Excel. The type to choose will vary depending on the data involved and what information the chart is intended to convey or highlight. Practice will improve your instinct on which type of chart to use in each instance. Initially it may be useful to try different types until the result is reasonably close to your requirements, and then add custom formats and elements as desired. Some chart types are very specialised and may only be of use to particular business sectors.

Available Types Of Chart

Selecting any of the types listed will apply a given chart type to the active chart. The most useful types available and some of their applications have been summarised below:

Area

Area charts can be 2 or 3-dimensional. They are used to compare the change in volume of a data series over time, emphasising the amount of change rather than the rate of change. Area charts show clearly how individual data series contribute to make up the whole volume of information represented in the graph.

Bar

Bar charts can be 2 or 3-Dimensional. They are used to show individual figures at a specific time or to compare different items. Categories are listed vertically, so that bars appear on the horizontal, thus there is less emphasis on time flow. Bars extending to the right represent positive values while those extending left represent negative values.

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Column

Column charts can be 2 or 3-Dimensional. They are frequently used to show variation of different items over a period of time. Categories (often days or months for example, representing a progression of time) are listed horizontally and columns are displayed side by side, making for easy comparisons.Two variations on the theme of Column charts are represented by further tools on the Chart toolbar. The Stacked Column chart can be used to show variations over a period of time, but also shows how each data series contributes to the whole. A further variation on the 3-D column chart produces 3-D columns in a 3-D plot area, receding away from the viewer.

Line

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Line charts can be 2 or 3-Dimensional. Line charts are used to compare trends over time. There are similarities with Area charts, but line charts tend to emphasise the rate of change rather than volume of change over time. 3D lines appear as "ribbons" which can be easier to see on the chart.

Pie

Pie charts can be 2 or 3-Dimensional. They are used to compare the size of the parts with the whole. Only one data series can be plotted, making up 100%. Pie charts within their own window can be made to "explode" by dragging one or more pieces of pie away from the centre.

Radar

Each category in a radar chart has its own axis radiating from the centre point. Data points are plotted along each spoke, and data points belonging to the same series are connected by lines.

XY Scatter Charts

XY charts are used to compare two different numeric data series, and can be useful in determining whether one set of figures might be dependent on the other. They are also useful if the data on the X axis represents uneven intervals of time or increments of measurement.

3-D Surface

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3-D Surface charts present information in an almost topographical layout. They can be used to pinpoint the high and low points resulting from two changing variables. It can be helpful to think of a 3-D surface chart as a 3-D Column chart which has had a rubber sheet stretched over the tops of the columns.

Combination

A combination chart allows you to overlay one 2-Dimensional chart type on top of another. This can be useful for comparing different types of data, or for charting data requiring two different axis scales. Once the combination chart has been set up, the actual type of the main or overlay chart can be changed by you.

To change the chart type:

Mouse

1. Click on chart to be changed..
2. Go to the **CHARTS** group on the **INSERT** ribbon. Select a chart type and click
3. Hovering your mouse over a chart type in the menu will bring up an explanation of that chart type
4. When you have chosen click once to select a chart type
5. Your chart will have changed

OR

1. Click on the **DIALOG BOX LAUNCHER** on the **charts** group on the **INSERT** ribbon.The **INSERT CHART** dialog will appear
2. Select a type from the left hand section and a sub type from the right hand section. Click**OK** to change the chart type

OR

1. Right click on the chart to call up the shortcut menuClick on **CHANGE CHART TYPE**
2. The **INSERT CHART** dialog will appearSelect a type from the left hand section and a sub type from the right hand section.Click **OK** to change the chart type

OR

1. Click on **CHANGE CHART TYPE** On the **TYPE** group on thE **DESIGN** ribbon. The **CHANGE CHART TYPE** Dialog box will appear
2. Select a new chart type
3. Click **ok**

Default Chart Type

The default graph setting in Excel is set to a simple 2 dimensional column chart, however you can change the default to any of the types offered within the chart type dialog.

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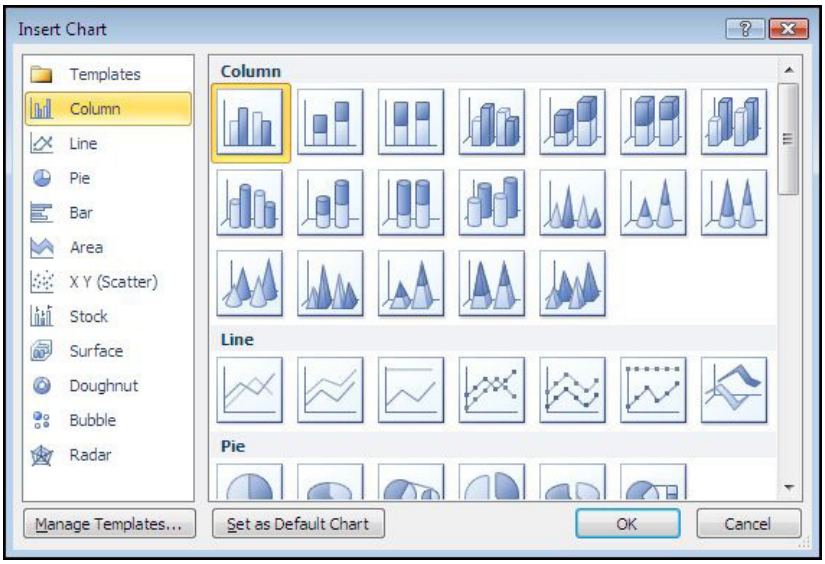
To set the default chart type:

Mouse



4. Click on the **DIALOG BOX LAUNCHER** on the **CHARTS** group on the **INSERT** ribbon.
5. The following dialog will appear

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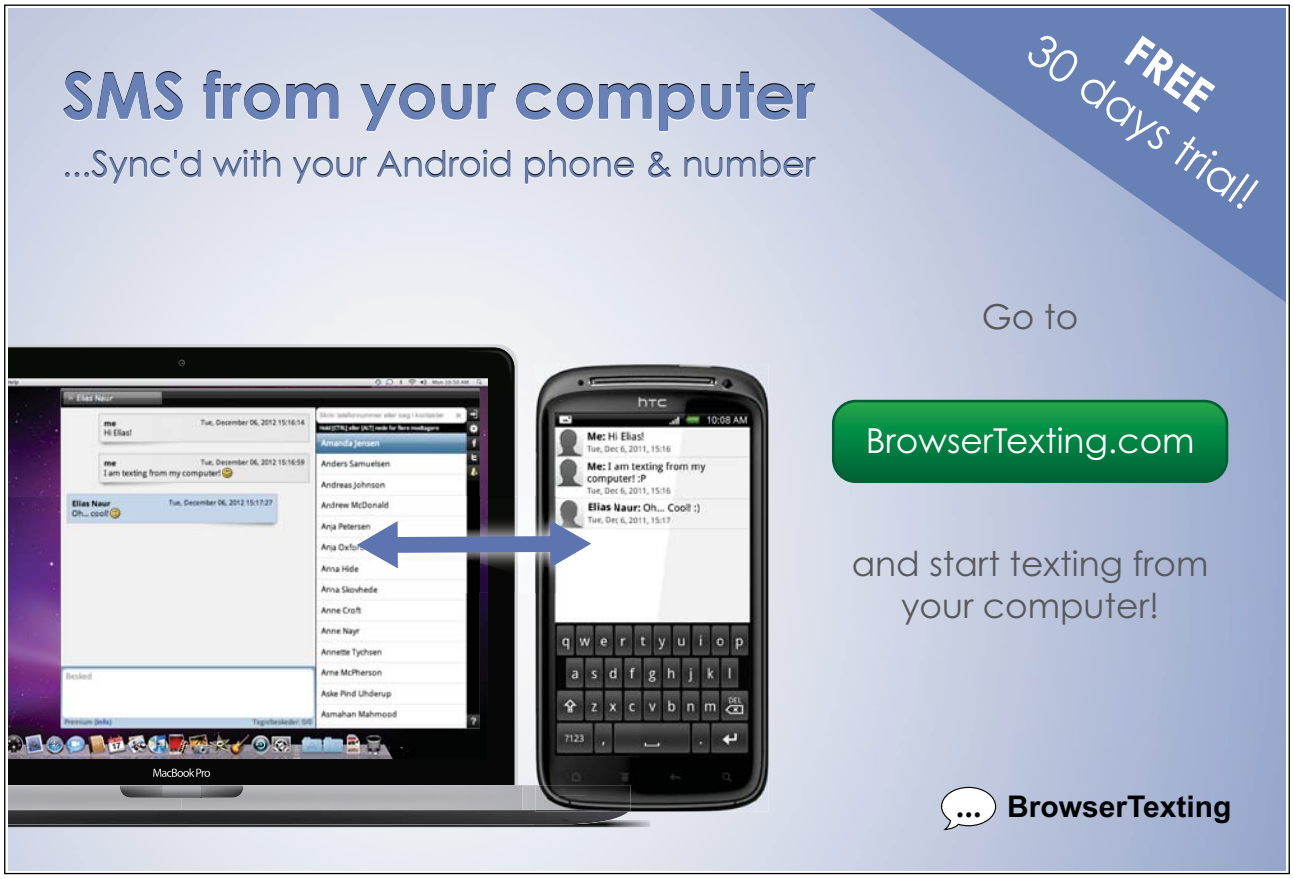

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6. Select a type from the left hand section and click on the specific format that you want the chart to have from the gallery of charts on the right.
7. Click the **SET AS DEFAULT CHART** button.
8. New charts created from now on will use the default format as defined by you when pressing **F11**

Formatting Charts

There are several different ways of formatting the various elements in a chart. Some formats, such as adding a legend can be applied to a chart using the following sections

Calling up the Shortcut menu on a Chart will also allow you to access the dialog boxes which can be used to change formatting on the entire chart.

Design Ribbon

The **design** ribbon is to change some very basic aspects of your chart globally for the chart we have already looked at changing the chart type. We will look at creating some of our own later on

Data Source

The data source is the selected data used to generate your chart you may wish to add, remove or completely change the data range your chart is based on it is easier than deleting and rebuilding and reformatting your chart.

To change data source

Mouse

1. Click on the Chart the contextual ribbons will appear.
2. Click on **SELECT DATA** in the **DATA** group the following dialog will appear

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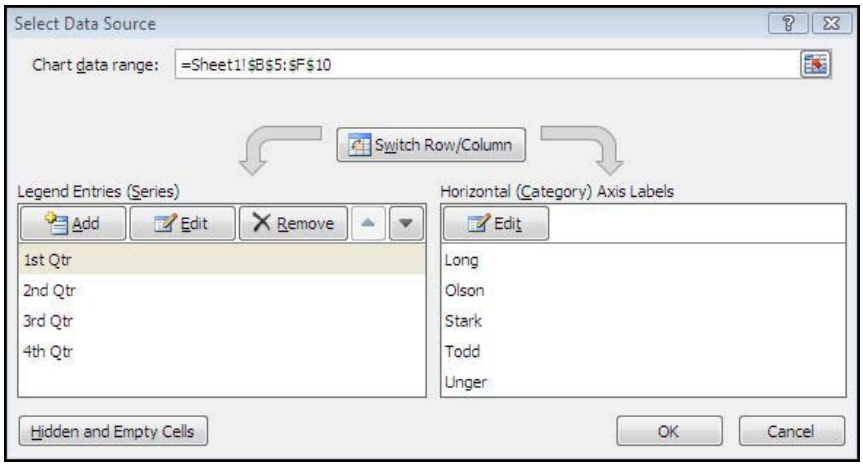

3. In the **CHART DATA RANGE** box a highlighted range will be seen.
4. If you need a completely new range then delete the values in this box and select a different range for your chart.
5. Use the **COLLAPSE / EXPAND** buttons to the right of the box to help you do this
6. Click on **ok**.

Be sure to include the row and column labels in this range. If you wish you may select more than one range by holding down the [CTRL] key down after you have selected your first range and then select another range.

Series And Categories

Series and categories are the row and column headings that make up your chart you may wish to add or remove them as the data may not be adjacent to each other or even on different sheets. You may wish to reorder them or delete some entirely.

To add or remove a series or category.

Mouse

1. Click on Chart.
2. Click on **SELECT DATA** in the **DATA** group the **SELECT DATA SOURCE** dialog will appear

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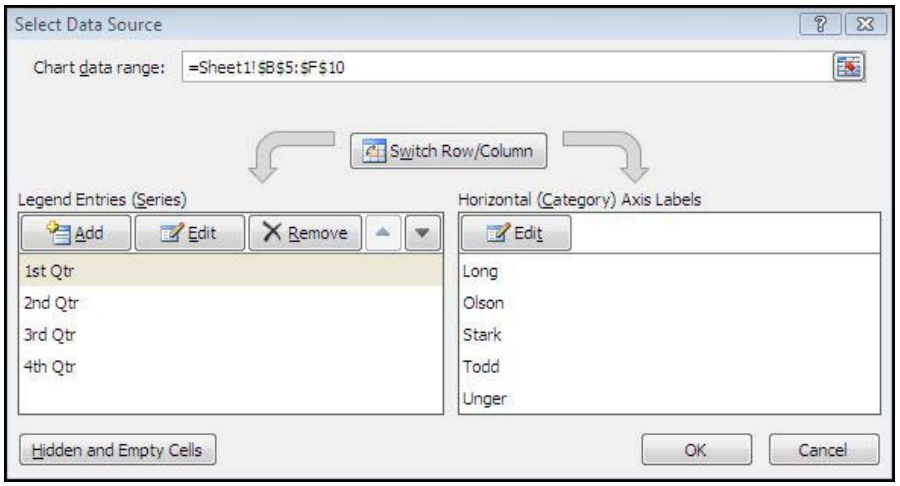

3. In the **LEGEND ENTRIES (SERIES)** box click on **ADD** the **EDIT SERIES** dialog will appear.

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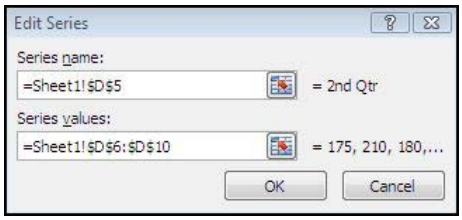
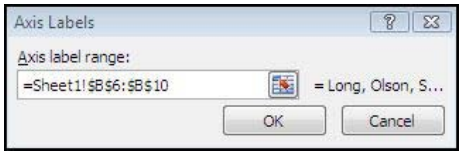


4. In the series name box select the cell that holds the series Label
5. In the series values box select the range of cells that will make up the data for that series.

- *For none adjacent labels use the ctrlkey to select*

6. Click **ok**
7. In the **HORIZONTAL (CATEGORY) AXIS LABELS** box click on **EDIT**



8. The **AXIS LABELS** dialog will appear
9. Reselect the range that will include any new category labels.

- *For none adjacent labels use the CTRL key to select*

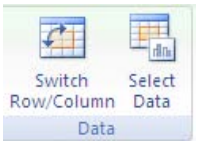
10. Click **OK.** and **OK** again to apply the new data to your chart.

To delete a series

Mouse

1. Click on Chart.
2. Click on **SELECT DATA** In the **DATA** group the **SELECT DATA SOURCE** dialog will appear
3. Select the series you wish to delete.
4. Click on **DELETE** the series will be removed.

To delete a category



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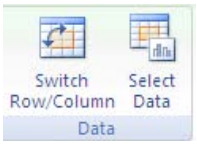
1. Click on Chart.
2. Click on **SELECT DATA** in the **DATA** group the **SELECT DATA SOURCE** dialog will appear
3. Click on the **SWITCH ROW/COLUMN** button. What was a category has now become a series
4. Now delete series as previously explained.
5. Click on the **SWITCH ROW/COLUMN** button on the dialog box. What were series have now become categories with the category you wished, removed.

Switch Rows And Columns



To switch between rows and columns

Mouse

1. Click on Chart.
2. Click on **SELECT DATA** in the **DATA** group the **SELECT DATA SOURCE** dialog will appear
3. Click on the **SWITCH ROW/COLUMN** button. What was a category has now become a series

OR

Mouse

1. Click on **CHART**.
2. On the **DESIGN** ribbon Click on **SWITCH ROW/COLUMN** in the **DATA** group
3. Your data has now switched rows to columns

This facility may not be available if multiple data ranges have been selected for your chart especially if they are different sizes and from different locations.

Add A Series Manually

Other methods To add a new data series to a chart:

Mouse

1. Select the worksheet cells containing the relevant data (including the label to be used if labels were included in the original data).
2. Copy this data to the clipboard in the usual way.
3. Activate the chart by clicking on it and choose Edit, Paste. The data series will appear in the chart.

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Or

1. Select the worksheet cells containing the relevant data
2. If Chart is an embedded chart on current sheet. Drag and drop selected data onto chart.

The added series will invariably come in as the final data series, but the order can be changed by you as outlined later in this document.

The Series Function

If a data series on a chart is selected, the reference area will display the underlying formula. It can be useful to know what elements go to make up the Series function, as you may edit it manually if desired. The Series function includes four arguments:

=SERIES(Series_Name,Categories_Ref,Values_Ref,Plot_Order)

The Series Name can be a reference (Worksheet!Cell) to the cell where the name of this particular data series is being held, or it may consist of text typed in by you and enclosed in quotation marks. The Series Name will be picked up in the legend to describe the data series.The Categories Reference refers to the worksheet name and range of cells where the Category (or x-axis) labels are to be found. If the data series are in rows, the category references will refer to the labels at the top of each column and vice versa.The Values Reference refers to the worksheet name and the range of cells containing the actual values for this data series which are to be plotted on the y-axis (or z-axis on a 3-D chart).The Plot Order number dictates the order in which the selected data series is plotted on the chart and listed on the legend.Often, instead of amending the Series function manually, you may find it easier to edit a data series using the dialog option covered in the earlier section.

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Charting With Blocks Of Data

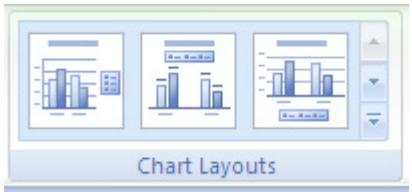
As it is possible to select separate ranges in Excel, it is possible to produce charts based on non-contiguous data. This is vital if some of the information on the worksheet is to be omitted. There are some guidelines to be aware of however. The layout of data is important as was demonstrated at the beginning of this document. The selected ranges must amount to a regular block with consistent height and width measurements so that Excel can interpret it correctly, with categories and data series matching up.Once the data has been successfully selected, choose File, New and click on Chart before clicking on OK, or tap [F11].An extension of this idea leads to the fact that ranges from separate worksheet files can be included in a single chart. Simply select the worksheet data to be included (subject to the layout provisos above), copy to the clipboard then paste them into the chart.

Changing The Chart Layout

As discussed earlier a chart is made up from many elements that can be turned on or off depending on the type of chart or arranged in different places on the chart. To change the layout swiftly instead of laboriously changing each element the change layout tool allows some quick global options.

To change the chart layout

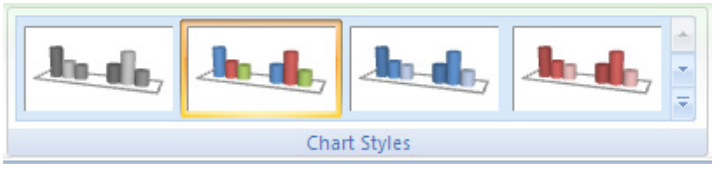
Mouse



1. Click on the drop down arrow on the **CHART LAYOUT** group
2. Select a chart Layout
3. The layout is applied

Chart Styles

A chart style is mainly a theme of formatting for your chart using the existing elements of your chart There are some very exciting colour schemes in this feature



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To apply a chart style

Mouse

1. Select chart
2. Click on the drop down arrow to the right of the **CHART STYLES** group.
3. Select a chart style
4. Your chart should now adopt the style chosen.

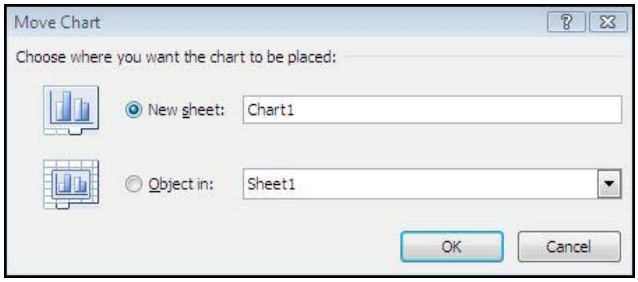
If the chart style is not to your liking apply another style following the same method until you have a style close to what you wish. We will look at formatting the various elements in a later chapter to achieve exactly what you want

Moving Chart Location

If you usually use one method to create a chart you will regularly get either a **SEPARATE SHEET CHART** or an **EMBEDDED** one and you may wish to switch between the two types. Or move your embedded chart to a different sheet within your workbook.

To move embedded chart between sheets

Mouse



1. Click on **MOVE CHART** on the **LOCATION** group. A dialog will appear.
2. Click on drop down arrow to the right of **OBJECT IN** select the sheet you wish to move it to
3. Click **ok**

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To switch between embedded and separate sheet

Mouse

1. Click on **MOVE CHART** on the **LOCATION** group. A dialog will appear.
2. Click on **NEW SHEET**
3. Name the sheet in the text box
4. Click **OK**
5. Embedded chart will now be on a separate sheet with the given name.
6. To create an embedded chart from a separate sheet chart select **CHOOSE AS OBJECT** in the dialog box.
7. Select a sheet to place it as an embedded object.
8. Click **OK**

Layout Ribbon

The Layout ribbon allows us to format, add or remove various elements of a chart. Some tools are only available, however for certain types of chart.

- *E.G. you cannot apply 3D rotation to a 2D chart.*

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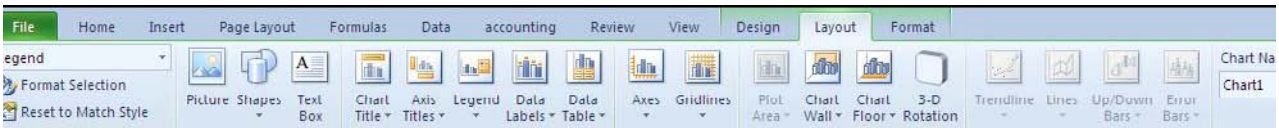
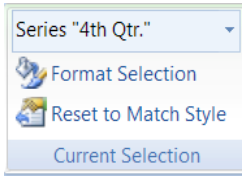


.

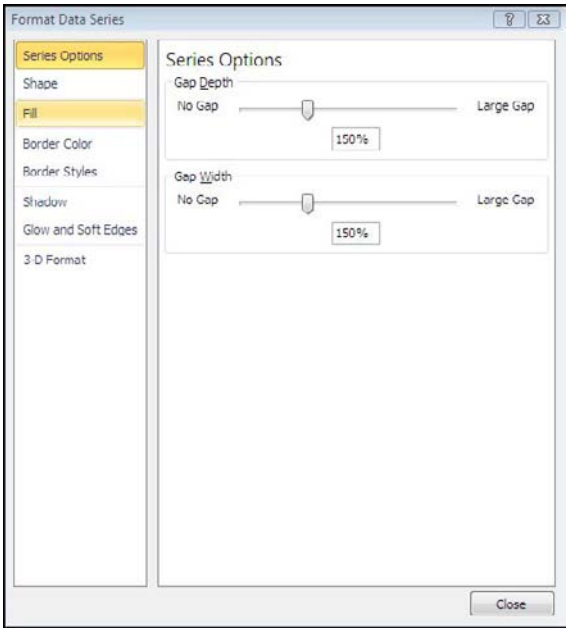
Formatting Chart Elements

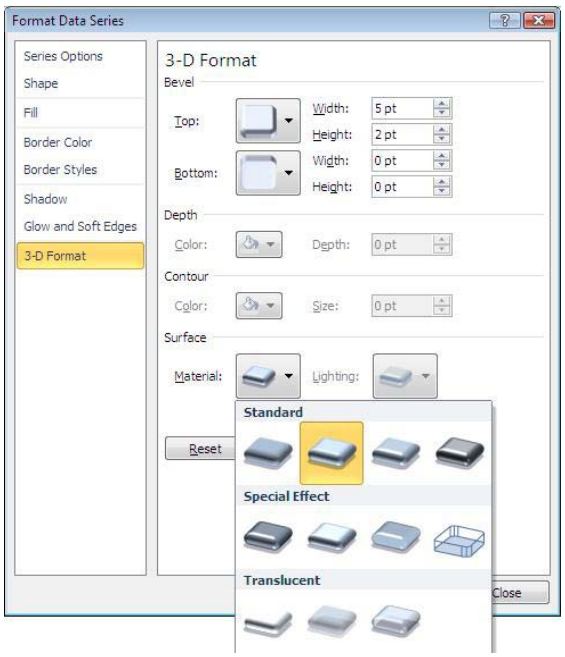
To select and format a chart element.

Mouse



1. Go to the **LAYOUt**ribbon.
2. To select an element of your chart, click on the drop down arrow to the right of top box in the **CURRENT SELECTIOn** group.
3. Click on a chart element. That element will be selected
4. Click on **format selection** in the **CURRENT SELECTION** group, the following dialog will appear.





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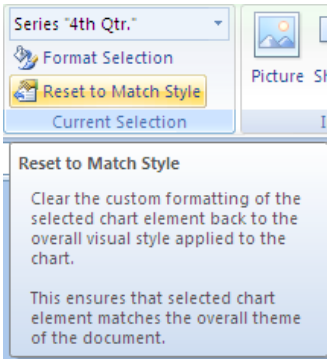
5. The left hand section of the dialog will give the various categories of how you may format your selection (These options may vary depending on the selection.)
6. The right hand section contains the available formats for that category.
7. Clicking on each category and setting your format choices will immediately affect you chart.
8. When you are satisfied with your formatting choices, click **close**.

Many of the options displayed in the category options section may involve other drop down boxes to make a selection. (see previous picture) if you move your mouse over these possible selections a help tip should appear to give you a description of that choice BEFORE actually making a selection. Any choice already applied will already be selected and have a different colour.

Resetting Custom Formats

When experimenting with various formats you may find it difficult to remember exactly what settings were applied to a specific element and therefore you would find it difficult to make it appear as it once was. Resetting the format of specific chart elements can be very useful.

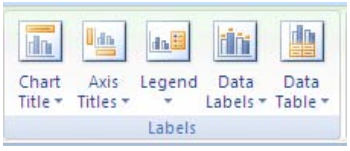

Series "4th Qtr."
Format Selection
Reset to Match Style
Current Selection
Picture
Reset to Match Style
Clear the custom formatting of the selected chart element back to the overall visual style applied to the chart.
This ensures that selected chart element matches the overall theme of the document.

To reset an element

Mouse

1. Make a selection of element to be reset
2. Click on **RESET TO MATCH STYLE** button on the **CURRENT SELECTION** group.
3. The selected element will revert back to the original format settings of the applied chart style.

Adding, Removing And Formatting Labels



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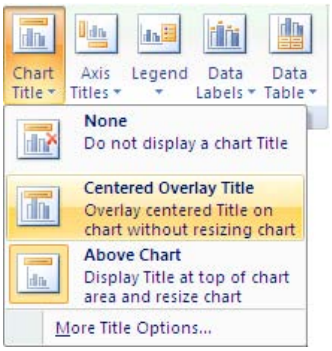
Information labels on your chart are very important on your chart especially if it is on a separate sheet. The **labels** group offers a selection of labels you may wish to show or hide on your chart. The chart layout choices previously explained uses a mixture of labels in different locations on your chart but you may wish to put specific labels on your chart and format them yourself and place them where you wish.

To add or remove labels.

Mouse



1. Select chart if embedded
2. Click on drop down arrow of type of label you wish to add or remove from the **LABELS** group.

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3. Make a selection from choices present.
4. Label will appear or disappear dependant on choice
5. Use the **DATA LABELS** button on the **LABELS** to write the values or the labels on the data markers.
6. Use the **DATA TABLE** button on the **LABELS** to add the plot data so that it is visible on the chart itself.

To format labels

Mouse

Select label element from drop down box in the **CURRENT SELECTION** group as mentioned previously.

Click on **FORMAT SELECTION** in the **CURRENT SELECTION** group as mentioned previously.

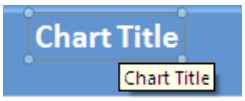
To edit label text

Mouse

1. Select label as previously discussed.
2. Click within the label and delete and retype with the text you require.
3. Click off label

To move or resize chart elements

Mouse



1. Make a selection of a chart element. (E.G. a label)
2. Handles will appear at each corner to show selection.
3. Moving mouse over label border should show a 4 pointed Black arrow. This appears to indicate that you are in the right position to click and drag to move the selected element.
4. Clicking within the label to edit the text the label will automatically resize to the size of the text entered

- *Selecting an element like the plot area will allow a double black arrow when moving over a handle. Clicking and dragging will resize that element.*

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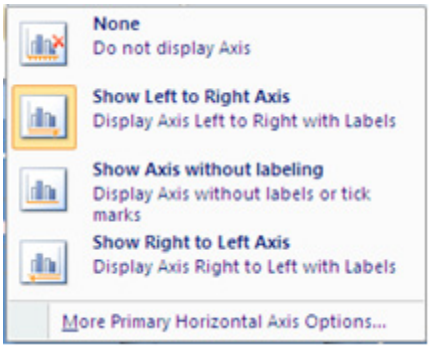
Axes

For various types of charts you may not wish to see both axes on the chart you are able to hide or show these axes dependant on your needs.

To add or remove axes from chart

Mouse


None
Do not display Axis
Show Left to Right Axis
Display Axis Left to Right with Labels
Show Axis without labeling
Display Axis without labels or tick marks
Show Right to Left Axis
Display Axis Right to Left with Labels
More Primary Horizontal Axis Options...

1. Select chart if embedded.
2. Click on drop down button on **axes** button on **axes** group
3. Select **primary horizontal** or **primary vertical axis**.
4. Make a selection from choices shown.

Selecting more primary horizontal or vertical options opens the formatting dialog which would appear if you selected the axis and formatted it. Using the axes menu is best for turning it off or on.

To format the Category (X) Axis:

Mouse

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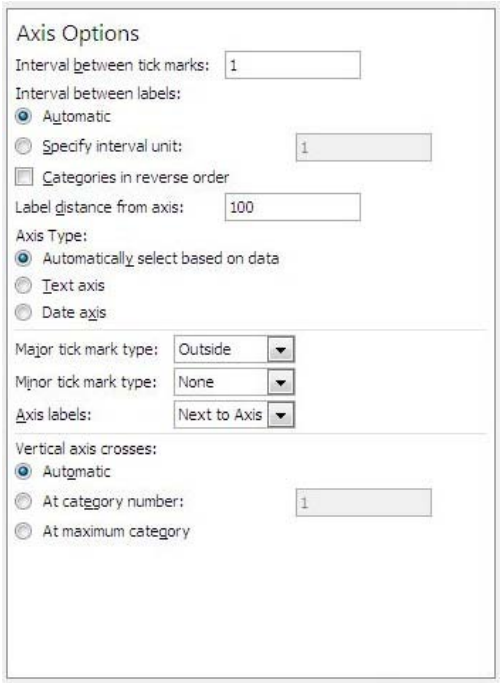

1. Select **CATEGORY AXIS**
2. Click **FORMAT SELECTION**

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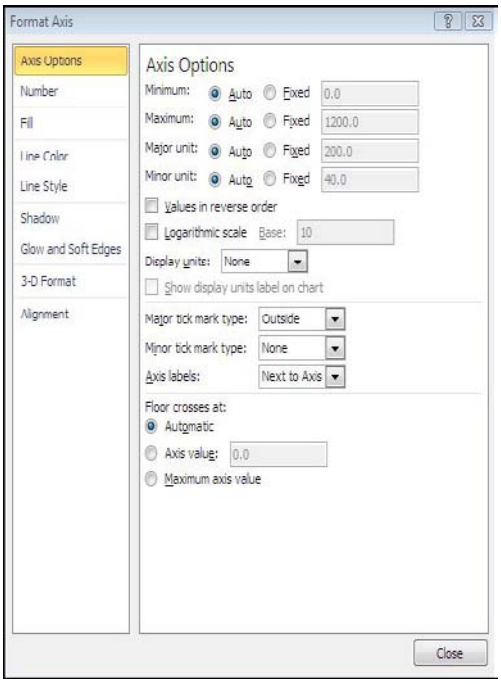
3. Under Major/Minor **TICK MARK TYPE,** you may click on the appropriate option button to specify that tick marks on the axis will appear on the inside or outside of the axis line, cross the axis line, or not appear at all. Minor tick marks can also be included (click on the Scale... button to set the intervals for major and minor tick marks).
4. The **AXIS LABELS** section allows you to dictate where the Labels associated with the selected axis will display. This can be at the High Values end of the axis, the low values end of the axis, next to the axis, or completely suppressed.
5. Use the **VERTICAL AXIS CROSSES** to specify at where the category axis will appear,
6. **USE AUTOMATIC POSITIONING**. The default setting is to have this box checked
7. Putting a value in the **SPECIFY INTERVAL UNIT** box will result in labels having more space between them
8. Categories may be displayed in reverse order if desired,
9. Use the **ALIGNMENT** category to specify the orientation of the category labels.



To format the Value (Y) axis:

Mouse

1. Select **VALUE AXIS**
2. Click **FORMAT SELECTION**
3. **AXIS OPTIONS** will have some different options relating to the values on the axis.
4. You may specify the Minimum and Maximum values to appear on the axis.
5. The intervals to be used as Major and Minor units on the axis may also be set.
6. You may dictate the point at which the value and category axes cross,
7. Whether or not the axes are plotted on a **LOGARITHMIC SCALE**,

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8. Whether to have the values plotted in Reverse order.

Gridlines

None
Do not display Horizontal Gridlines
Major Gridlines
Display Horizontal Gridlines for Major units
Minor Gridlines
Display Horizontal Gridlines for Minor units
Major & Minor Gridlines
Display Horizontal Gridlines for Major and Minor units
More Primary Horizontal Gridlines Options...

Gridlines are the indicator lines that run across your chart to either divide up your categories or give visual help when deciding on a value for a data point more distant from the value axis. You may need more, or less of these, dependent upon your needs for accuracy or visual impact.

To change gridline options

Mouse

1. Select chart if it is embedded.
2. Click on drop down arrow on **GRIDLINES** on the **AXES** group.
3. Choose **PRIMARY HORIZONTAL** or **PRIMARY VERTICAL GRIDLINES** and make a selection from the choices given.

Unattached Text

Floating text may be typed directly onto the Chart, then dragged to the desired position.

To add floating text to a chart:

Mouse

1. Go to the **INSERT** ribbon and select the **TEXT BOX** button click on your chart and a text box will appear. Type required text, resize and format text box and drag to required location.

Format Dialog

Element options

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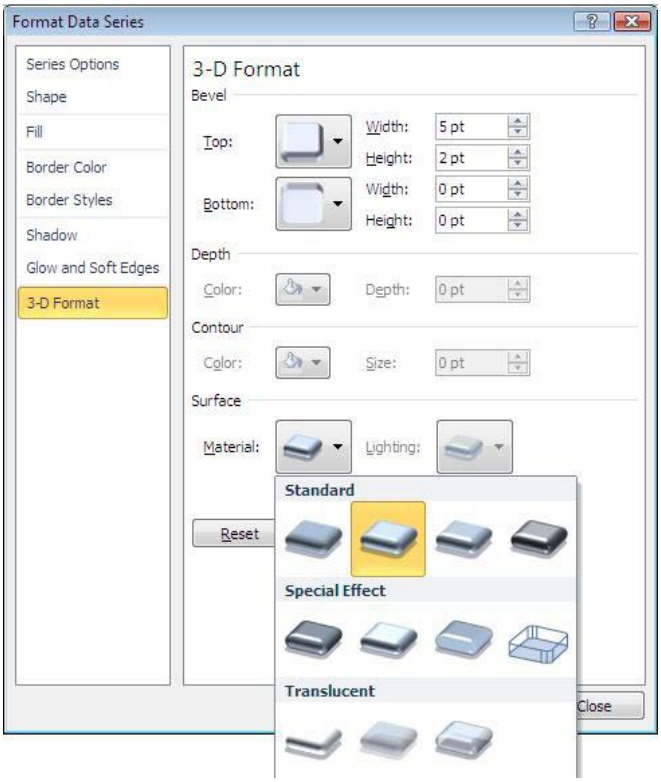

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This categories shown on the left hand side of the dialog box vary, dependent on what chart element is selected it may show **AXIS, CATEGORY OR SERIES OPTIONS.** For **SERIES OPTIONS** it allows you to change the width of the column or gap between the series. **AXIS OPTIONS** allows you to specify widths and separation options where the axis begins and ends(if available). The format dialog may show 3D options if you have selected chart elements that support this.

Fill

Use the **FILL** category to specify background colours or designs.

Shape

Use this category to set the shape for a selected element (series or data point if available)

Borders

Select the **BORDER** colour to change the border colour and set a border

Set the **BORDER STYLES** category to add a border around the outside of the selected element

Shadow

This option allows you to set the shadow depth , colour and direction for the selected element.

3-D Format

If you have a chart that has a **3-D** format this category will allow you to change many aspects of the **3-D** appearance such as the material, lighting, contour, depth and bevel.

Depending on the data being displayed, some data markers on a 3-D chart may be obscured. It is possible to adjust the view so that your data may be seen to its best advantage. You may influence the degree of elevation, perspective or rotation of your chart. A sample chart within the 3-D view dialog box reflects the new views as you change these factors.

Elevation and Rotation can be adjusted either by typing values into the appropriate sections within the dialog box, or by clicking on the arrow buttons displayed around the sample chart. The latter technique is obviously easier.

Elevation dictates the height from which you view the data. Ranging from 90°(above the plot area) to -90°(below the plot area), where 0° represents a view level with the centre of the plot area. With 3-D Pie Charts, the range varies from 10°, almost level with the edge of the pie, to 80°, looking down on the surface of the pie.

3-D Rotation

Selecting the plot or chart area will allow you to rotate your chart in any direction or change the perspective of your chart.

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Rotation

Rotation allows you to turn the graph on its vertical axis. The range goes from 0° to 360°, where zero views the chart from the front, 90° would view it from the side, and 180° would allow you to see it from the back - effectively reversing the order of the data series for the chart display.

Perspective

Perspective can be changed to make the data at the back of a 3-D chart appear more distant. A perspective of zero means that the farthest edge of the chart will appear as equal in width to the nearest edge. Increasing perspective (up to a maximum of 100) will make the farthest edge appear proportionally smaller.

You may also affect the height of the graph in relation to its width and whether or not you want the axes to remain at right angles. This latter setting would preclude the use of perspective in 3-D charts. Auto-scaling allows Excel to scale a 3-D chart so that, where possible, it is similar in size to its 2-D equivalent.

Font

The font for any selected textual element can be set on the **HOME** ribbon from the **FONT** group or right clicking on the highlighted text and using the mini toolbar.

Formatting The Legend

The Legend can be selected and formatting like the other chart elements The legend can be positioned manually simply by pointing and dragging it to a new position on the chart, but there are some preset positions which can be selected from legend button in the **LABEL** group

Note that the legend cannot actually be resized. Changing the font size will cause the size of the overall legend to adjust, but it cannot be resized by dragging on the selection handles. No chart element which shows white selection handles (rather than the usual white) can be resized by dragging.Dragging the legend to a new position on the chart will sometimes affect the shape of the legend and the size of the chart. The legend may be placed overlapping the chart. Note that the text appearing in the Legend box is picked up from the worksheet data. Edit the text on the worksheet in order to change the legend text (The legend may be deleted(hidden) by selecting it and pressing the Delete key on the keyboard.

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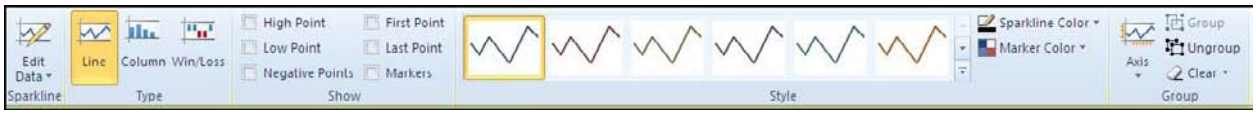
Sparklines

What are Sparklines?

Unlike charts on an Excel worksheet, Sparklines are not objects — a Sparkline is actually a tiny chart in the background of a cell. Because a Sparkline is a tiny chart embedded in a cell, you can enter text in a cell and use a Sparkline as its background

You can apply a colour scheme to your Sparklines by choosing a built-in format from the Style gallery (Design tab, which becomes available when you select a cell that contains a Sparkline). You can use the Sparkline Colour or Marker Colour commands to choose a colour for the high, low, first, and last values (such as green for high, and orange for low).



When one or more Sparklines are selected, the **SPARKLINE TOOLS APPEAR**, displaying the **DESIGN** tab.

Data presented in a row or column is useful, but patterns can be hard to spot at a glance. The context for these numbers can be provided by inserting Sparklines next to the data. Taking up a small amount of room, a Sparkline can display a trend based on adjacent data in a clear and compact graphical representation. Although you don't have to have a Sparkline cell directly next to its underlying data, it is a useful.

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Name	October	November	December	
Long	110	175	140	Sales
Olson	200	210	240	Sales
Stark	300	180	295	Sales
Unger	220	195	185	Sales

You can quickly see the relationship between a Sparkline and its underlying data, and when your data changes you can see the change in the Sparkline immediately. In addition to creating a single Sparkline for a row or column of data, you can create several Sparklines at the same time by selecting multiple cells that correspond to underlying data.

Create Sparklines

You can also create Sparklines for rows of data that you add later by using the fill handle on an adjacent cell that contains a Sparkline.

One advantage of using Sparklines is that, unlike charts, Sparklines are printed when you print a worksheet that contains them.

To Create a Sparkline

Mouse

1. Select an empty cell or group of empty cells in which you want to insert one or more Sparklines.
2. On the **INSERT** tab, in the **SPARKLINES** group, click the type of Sparkline that you want to create: **LINE**, **COLUMN** or **WIN/LOSS**.

3. In the **DATA** box, type or select the range of the cells that contain the data on which you want to base the Sparklines.
4. In the **LOCATION RANGE** box select where you wish your Sparklines placed.

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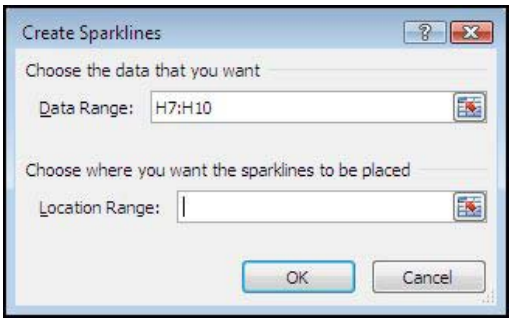

5. Click on **OK**.

You do not select data labels as in normal charts merely the actual data for your Sparklines. You can click to temporarily collapse the dialog box, select the range of cells that you want on the worksheet, and then click to restore the dialog box to its normal size.

After you create Sparklines, you can control which value points are shown (such as the high, low, first, last, or any negative values), change the type of the Sparkline (Line, Column, or Win/Loss), apply styles from a gallery or set individual formatting options, set options on the vertical axis, and control how empty or zero values are shown in the Sparkline.

To remove a Sparkline

Mouse

1. Select a Sparkline or multiple Sparklines.
2. Use the dropdown arrow on the **CLEAR** button in the **GROUP** group on the **DESIGN** ribbon.
3. Make a selection of what you wish to clear.
4. Selected Sparklines are deleted.

Customize Sparklines

On the **DESIGN** tab, you can choose one or more of several commands from among the following groups: **SPARKLINE**, **TYPE**, **SHOW/HIDE**, **STYLE**, and **GROUP**. Use these commands to create a new Sparkline, change its type, format it, show or hide data points on a line Sparkline, or format the vertical axis in a Sparkline group.

Axis options

To set axis options

Mouse

If your data range includes dates, you can:

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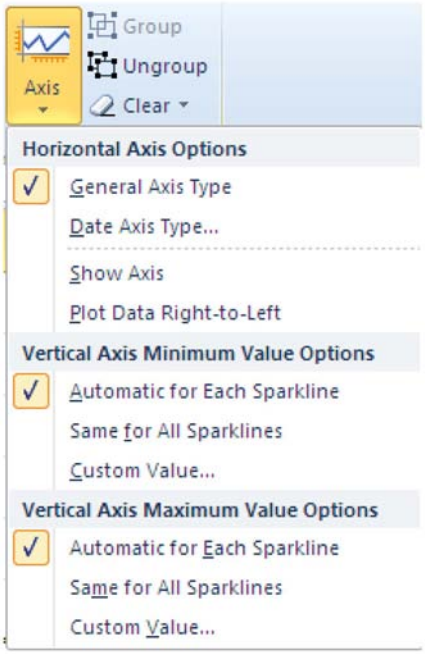

1. Select your Sparkline.
2. Select **DATE AXIS TYPE** from the **AXIS** options on the **DESIGN** ribbon to arrange the data points on the Sparkline to reflect any irregular time periods.

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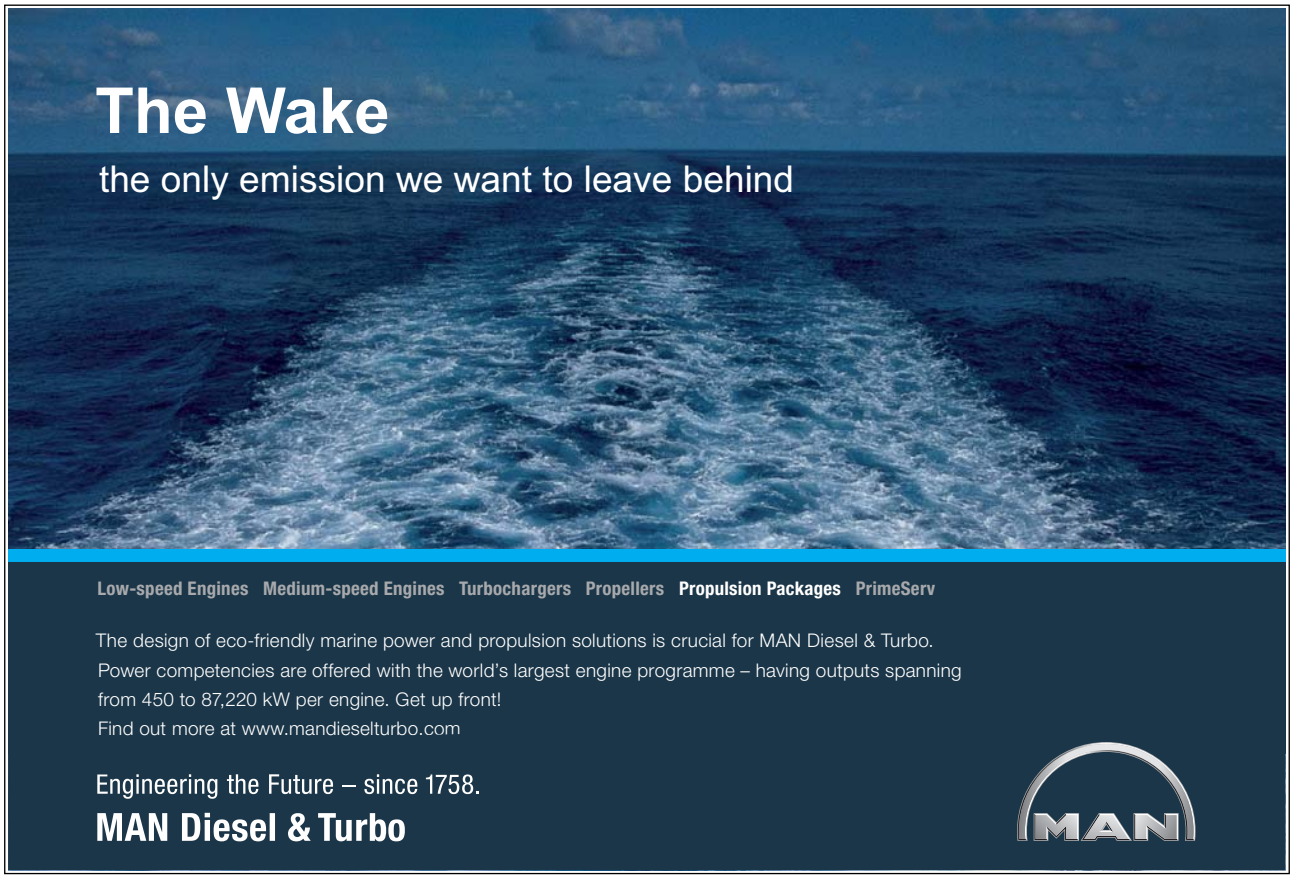
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MAN

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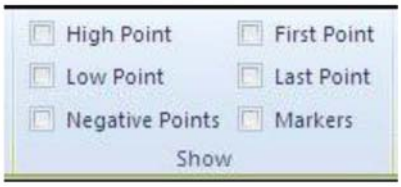
- ***E.G.*** *If your first three data points are each separated by exactly one week and the fourth data point is one month later, the space between the third and the fourth data points is increased proportionally to reflect the greater time period.*
- *You can also use the* ***AXIS*** *options to set minimum and maximum values for the vertical axis of a Sparkline or Sparkline group.*
- *Setting these values explicitly helps you control the scale so that the relationship between values is shown in a more meaningful way.*
- *You can also use the Plot Data Right-to-Left option to change the direction in which data is plotted in a Sparkline or Sparkline group.*
- To Control which value points are shown

Mouse

You can highlight individual data markers (values) in a line Sparkline by making some or all of the markers visible.



1. Select your Sparkline / Sparklines.
2. Go to the show group on the design ribbon and make one or more of the following choices:

- *To show all values, select the* ***MARKERS*** *check box.*
- *To show negative values, select the* ***NEGATIVE POINTS*** *check box.*
- *To show the highest or the lowest values, select the* ***HIGH POINT*** *or* ***LOW POINT*** *check boxes.*
- *To show the first or the last values, select the* ***FIRST POINT*** *or* ***LAST POINT*** *check boxes.*
- Clearing a check box hides the specified marker or markers.

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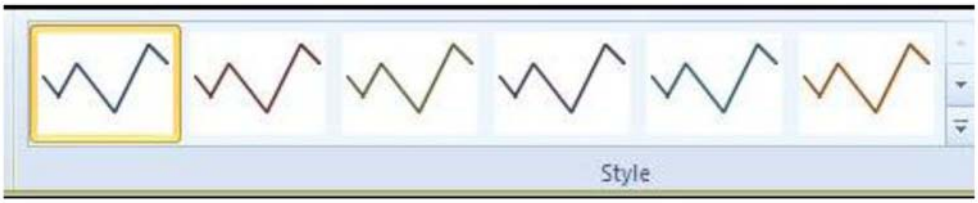
To Change the style of or format Sparklines

Mouse

Use the Style gallery on Design tab, which becomes available when you select a cell that contains a Sparkline.



1. Select a single Sparkline or a Sparkline group.
2. To apply a predefined style, on the **Design** tab, in the **Style** group, click a style or click the arrow at the lower right corner of the box to see additional styles.
3. Make a selection.
4. To manually apply formatting to a Sparkline, use the **Sparkline Colour** or the **Marker Colour** commands.

To enter sparkline titles

Mouse

1. Click on a cell that contains a Sparkline type in the title you wish for it
2. Press return.
3. Format title as you would for text in a cell so as not to obscure your Sparkline.

To Handle empty cells or zero values

Mouse

You can control how a Sparkline handles empty cells in a range by using the Hidden and Empty Cell Settings dialog box.

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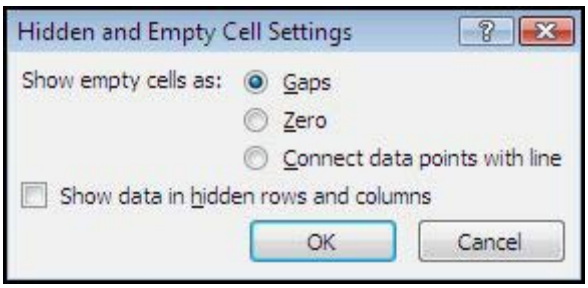
Mouse



- Click on the edit data drop down arrow in the Sparkline group on the design ribbon.
- From the menu select **Hidden & empty cells** a dialog appears.
- Select from the options how you want your empty data cells to appear within your Sparkline
- Click on **OK**

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5 Templates

Objectives

By the end of this section you will be able to:

- Use the standard Excel templates
- Create Custom templates
- Open and edit templates
- Set template properties

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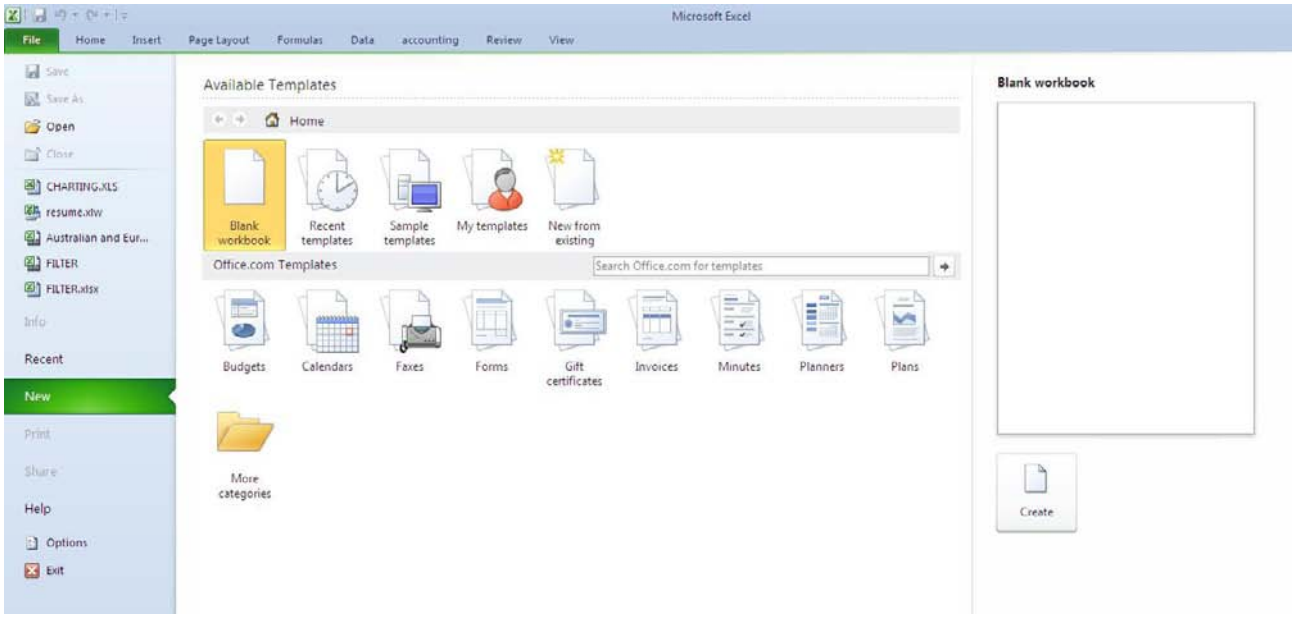
Introduction To Templates

A template is a file used as a form to create other workbooks, sheets and charts. New workbooks created from the template contain the same layout, data, formulae, formats and styles as those of the template. New sheets and charts inserted into a workbook are a copy of the sheet or chart template.



Template Types

There are three main categories of templates you may work with

- *Your created templates*
  These are templates you have created yourself you may design a workbook format it create calculations charts etc and save them as templates so periodically you can create new workbook based on these to enter new data.

- *Installed templates*
  These are templates installed as excel was installed to allow you to save time if you quickly want to create a billing workbook or expenses report. They may not be perfect for your needs but they are a good starting point and can easily be edited to suit your needs

- *Templates online*
  As the name suggests these are only available when connected to the internet and have an extremely wide variety of choice as a starting point for your workbook. Many of these templates show how you may work with excel in ways you may not have thought about some with advanced formatting to allow your work to look professional and to take the hard work out of creating your own workbook.

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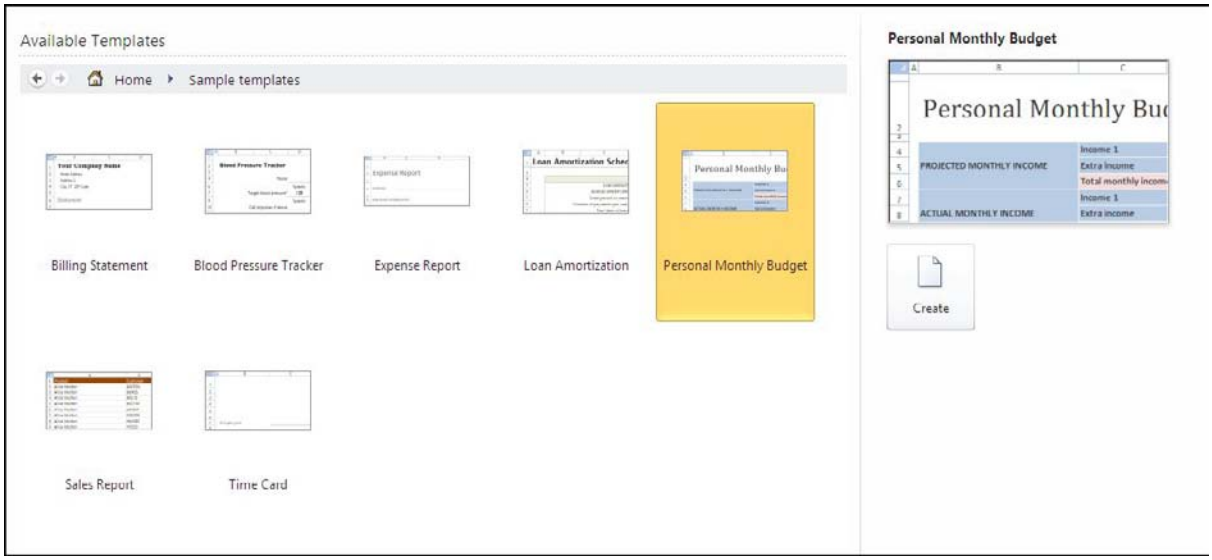
Normal Template

Every time you create a new workbook you are using the normal template as it is called a blank workbook picks up its default format and layout settings from it. Some of these defaults can be changed so when you create a new blank workbook you will see some of the default settings will have changed from the normal installation settings.

Sample Templates

Excel comes supplied with a selection of templates designed to help in the production of common business and home financial tasks. These templates can be modified for personal use.



- *Only those in the HOME category will be available when offline.*

To use a standard template:

Mouse

1. Click on the **FILE RIBBON** and select the **NEW** button.
2. From the main screen areaClick the **SAMPLE TEMPLATES** button to see a list of installed Excel templates in the centre section of the dialog
3. Click on the Picture for the template you wish to base the new workbook on to see a preview on the right.
4. When you have located the template you wish to use click **CREATE.**

OR

1. Click on the **FILE RIBBON** and select the **NEW** button.
2. From the main screen areaClick under the **OFFICE.COM TEMPLATES** click a section pertaining to your

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need to see a list of appropriate Excel templates in the centre section of the dialog.

3. Click on the Picture for the template you wish to base the new workbook on to see a preview on the right.
4. When you have located the template you wish to use click **CREATE.**

N.B. You must be connected to the internet to use templates from Office.com.

Create Custom Templates

You can create your own workbook and sheet templates.

To create a workbook template:

Mouse

1. Open or create the workbook to be used as the basis for the template.
2. Click on the **FILE RIBBON** and select the **SAVE AS** button, the **SAVE AS** dialog above will appear
3. Type the template name in the **FILE NAME** text box.
4. Select **EXCEL TEMPLATE** from the **SAVE AS TYPE** list. An .**XLTx** extension will be added to the template name.
5. The folder where the file will be stored will automatically change to Templates. By storing all .**XLTx** files in the same folder Excel recognises and keeps track of templates.
6. Click **SAVE** to save the template.

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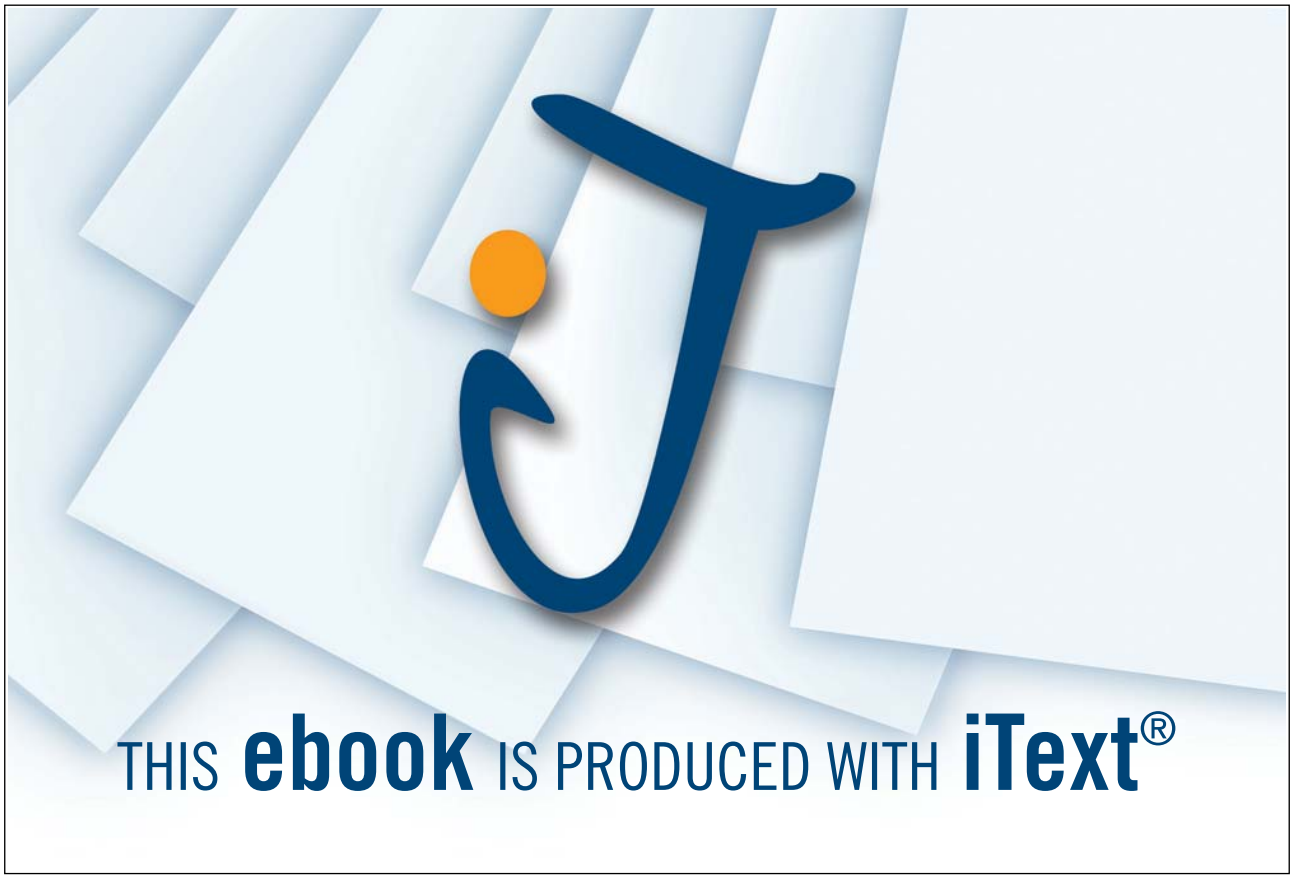

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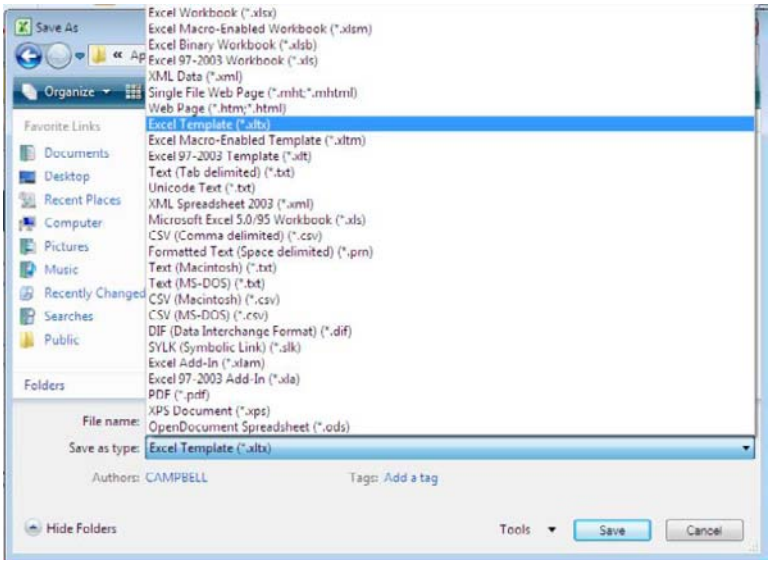

To create a worksheet template:

Mouse

1. In a new or existing workbook delete all the sheets except the one to be used as the template.
2. Click on the **FILE RIBBON** and select the **save as** button,the save as dialog will appear
3. Type the template name in the **FILE NAME** text box.
4. Select **EXCEL TEMPLATE** from the **SAVE AS TYPE** list.
5. The folder where the file will be stored will automatically change to Templates.
6. Click **SAVE** to save the template.

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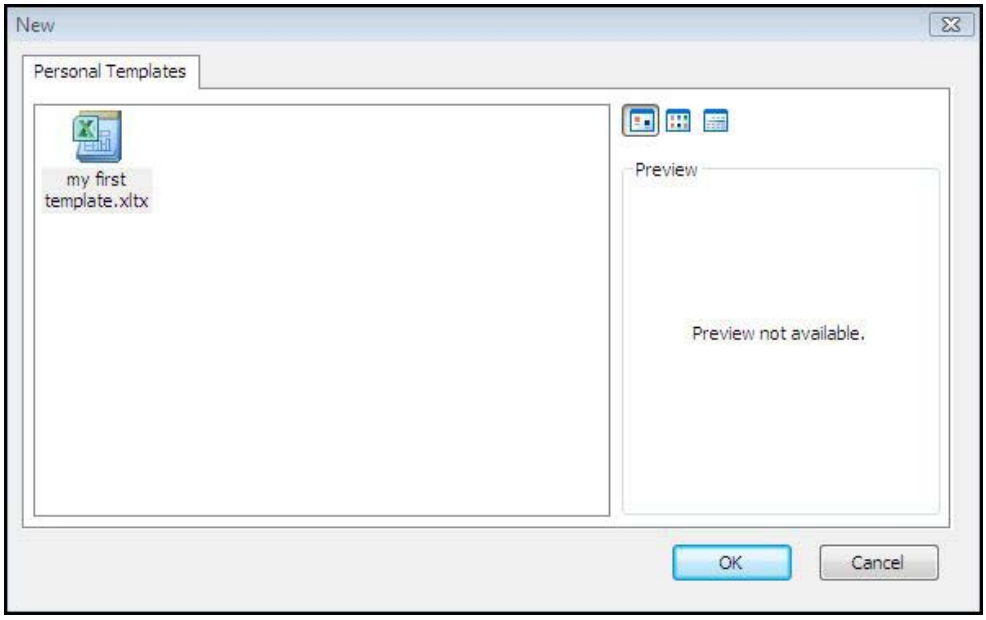
To Use Custom Templates

To base a new workbook on a template:

Mouse

1. Click on the **FILE RIBBON** and select the **NEW** button,



2. From the main screen area Click the **MY TEMPLATES** button to see a list of templates that you have created in a dialog called **NEW**
3. Click on the Picture for the template you wish to base the new workbook on to see a preview on the right.(if available)
4. When you have located the template you wish to use click **CREATE.**

To add a worksheet based on a sheet template:

Mouse

1. Click the right mouse button over a sheet tab and choose **INSERT**.
2. click the icon for the worksheet template you want to base the new sheet on.
3. Click **OK**

Opening And Editing Templates

Templates are files just like workbooks. If you need to change a template in any way, simply open, edit and save in the normal way.

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To open a template:

Mouse

1. Click on the **FILE RIBBON** and select the **OPEN** button
2. Change the **LOOK IN** location to the Templates folder.
3. Select the name of the template you want to open. click **OPEN**

To edit a template:

Mouse

1. Make changes in the open template.
2. Click on the **FILE RIBBON** and select the **SAVE** button

Template Properties

Files have various properties that are saved with them. Some properties, such as date created and last saved date are included and updated automatically by Excel. Others, such as title and subject must be entered manually by the user. Properties are helpful when trying to locate files as you can use the properties to search.

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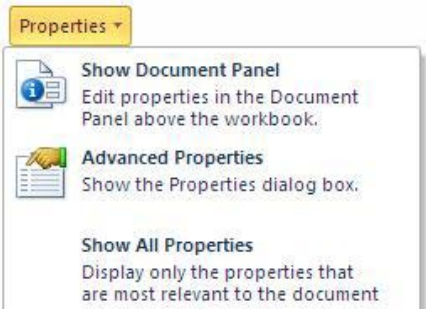
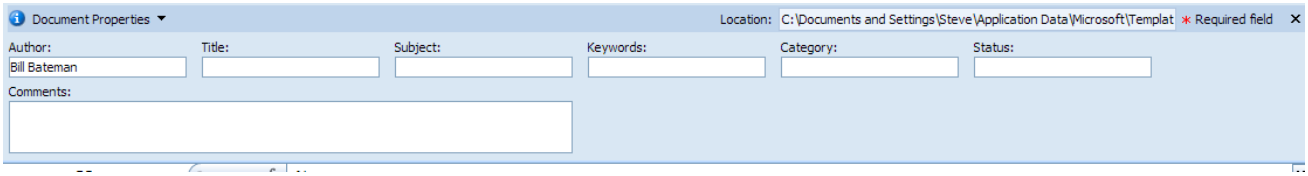

Properties
Show Document Panel
Edit properties in the Document Panel above the workbook.
Advanced Properties
Show the Properties dialog box.
Show All Properties
Display only the properties that are most relevant to the document

To set template properties:

Mouse

1. With the template open Click on the **FILE RIBBON** and select the **INFO** button and select the **PROPERTIES** under the preview of the file.
2. From the drop down list choose show document panel



3. A section (below) will appear under the formula bar.
4. Set the properties that apply to the template.
5. Click **X**in right hand corner of this bar to close

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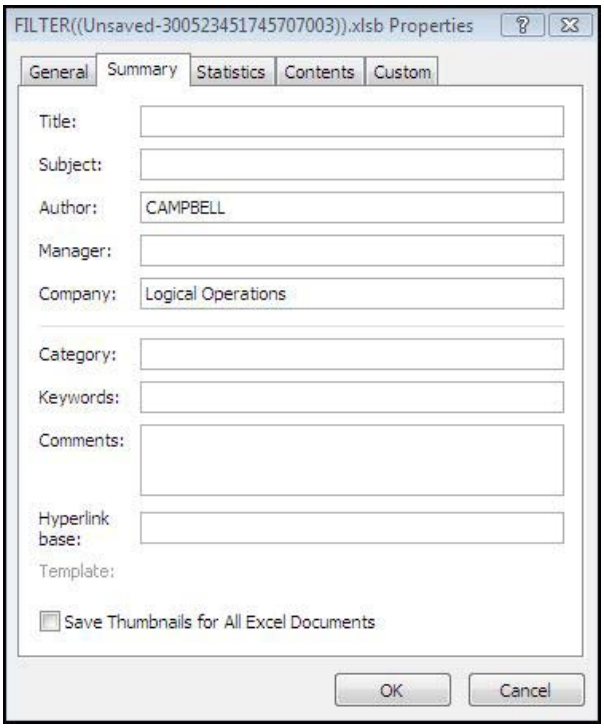

6. If you have further properties to set. Click on document properties on the bar and choose **ADVANCED PROPERTIES** the dialog on the right will appear
7. the 5 separate tabs allow the input of many more pieces of information.
8. When complete click on **OK.**

Templates can contain custom number formats and predefined styles.

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Auto templates

An autotemplate is a workbook saved as a template in the **XLSTART** folder or alternate Startup folder using the specific filename Book.xltx, sheet.xltx, dialog.xltx or macro.xltx. AutoTemplates if they exist will act as the basis for all new items you create in the Excel environment.

The Book.xltx template becomes the default workbook. The Sheet.xltx template becomes the default worksheet.

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6 Drawing and formatting

- Insert objects onto your spreadsheet
- Format drawing objects
- Use SmartArt
- Use and create themes
- Use and create cell styles
- Use conditional formatting

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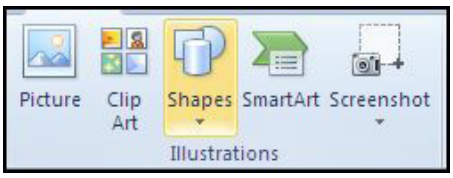
Inserting, Formatting And Deleting Objects

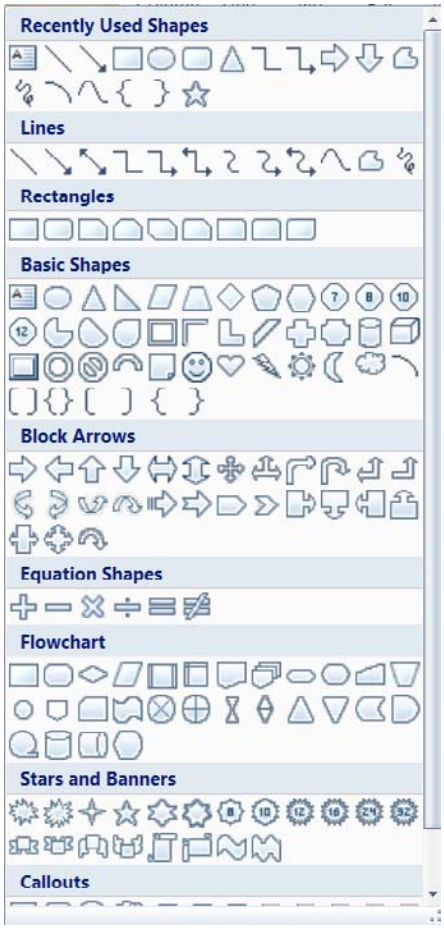
Inserting A Drawing Object



Inserting pictures, text boxes, callouts, scanned images etc onto a worksheet can greatly enhance your overall spreadsheet appearance. The subject of dealing with these objects will be looked at more thoroughly in PowerPoint as that application deals primarily with inserted objects and how to deal with them as word works primarily with text and excel with figures, however here is a brief rundown of some items you may insert and how to deal with them.

To insert a shape onto worksheet.

Mouse



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1. On the **INSERT** ribbon in the **ILLUSTRATIONS** group, click on the drop down arrow next to **SHAPES.**
2. Make a selection by clicking with the left mouse button on the desired shape. If you cannot immediately find what you want, scroll down using the scroll bar to the right to locate other shapes.
3. The menu will dissappear but your mouse cursor will appear as a small black cross. Click and drag diagaonally to place the shape on the worksheet.

To move or resize shape

Mouse

1. Select shape by clicking on it selection will be shown by resize handles appearing around the shape.

- *A **RESIZE HANDLE** is a one of nine small circles that appear equally around an object when it is selected.*

2. Moving mouse cursor over shape should give a four pointed arrow clicking and dragging with this cursor will move the shape to desired position.
3. You can use the cursor keys for small adjustments in moving shape into position.

OR

1. A double arrow will appear as you move over a resize handle to resize the shape. Click and drag to resize.

To delete a shape

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Mouse

1. Select shape by clicking on it selection will be shown by handles appearing around the shape.
2. Press **DELETE** on the keyboard to remove shape.

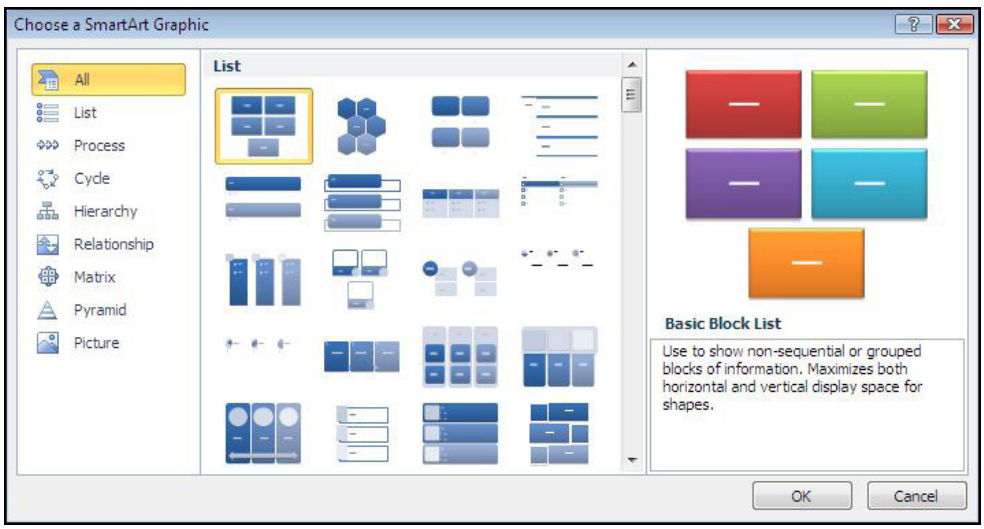
SmartArt

A SmartArt graphic is a visual representation of your information and ideas. You can create SmartArt graphics by choosing from among many different layouts to quickly, easily and effectively communicate your message.

Most people create content that contains only text, even though illustrations and graphics help audiences understand and recall information better than text. Creating designer-quality illustrations can be challenging, especially if you are not a professional designer or you cannot afford to hire a professional designer. If you use earlier versions of Microsoft Office, you can spend a lot of time making shapes the same size and aligning them properly, getting your text to look right, and manually formatting the shapes to match the document's overall style, instead of focusing on your content. With SmartArt graphics and other new features such as themes, you can create designer-quality illustrations with only a few clicks of your mouse.

When you create a SmartArt graphic, you are prompted to choose a type such as **PROCESS, HIERARCHY, CYCLE,** or **RELATIONSHIP**. A type is similar to a category of SmartArt graphic, and each type contains several different layouts.

When you choose a layout for your SmartArt graphic, ask yourself what you want to convey and whether you want your information to appear a certain way. Because you can quickly and easily switch layouts, try different layouts (across types) until you find the one that best illustrates your message. Experiment with different types and layouts by using the table below as a starting point.



When you switch layouts, most of your text and other content, colours, styles, effects, and text formatting are automatically carried over to the new layout.

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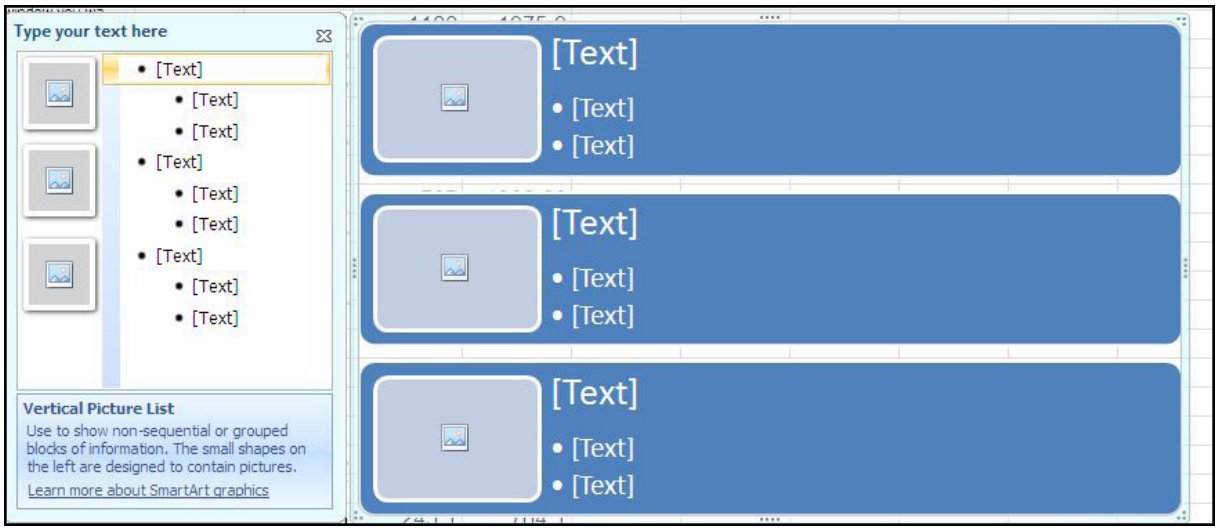
To insert a SmartArt graphic

Mouse

1. On the **INSERT** ribbon in the **ILLUSTRATIONS** group, click on the drop down arrow to the right of **SMARTART** the **SMARTART** dialog above will appear
2. Choose a category from the left thena graphic from the centre to see a preview on the right.
3. When you have the selection you desire click ok to insert the smartart on your worksheet
4. The smart art will appear on your worksheet as in picture below.



About the Text pane

The Text pane is the pane that you can use to enter and edit the text that appears in your SmartArt graphic. The Text pane appears to the left of your SmartArt graphic. As you add and edit your content in the Text pane, your SmartArt graphic is automatically updated— shapes are added or removed as needed.

When you create a SmartArt graphic, the SmartArt graphic and its Text pane are populated with placeholder text that you can replace with your information. At the top of the Text pane, you can edit the text that will appear in your SmartArt graphic. At the bottom of the Text pane, you can view additional information about the SmartArt graphic.

To enter text into SmartArt

Mouse

1. Click on placeholder in the **TEXT PANE.**
2. Placeholder text will disappear.
3. Type required text and press **ENTER**

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4. Focus will create a new placeholder and new shape waiting for text
5. Press **TAB** to move the text lower in the hierarchy in the example above or **SHIFT** + **TAB** to move it higher.

To remove a SmartArt shape

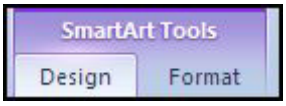
Mouse

6. Select the text or placeholder text of the shape you wish to remove in the **TEXT PANE**.
7. Press **DELETE** key on keyboard

Both text and shape will be removed from worksheet.

SmartArt Formatting

As you create a piece of smart art and click on the object you will see two contextual menus appear one for design and one for format.



Both ribbons appear below we will quickly look at some of the option to allow you to format your SmartArt object

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Quick Styles

Quick Styles are combinations of different formatting options and are displayed in a thumbnail in the various Quick Style galleries. When you place your pointer over a Quick Style thumbnail, you can see how the Quick Style affects your SmartArt graphic or shape.

Quick Styles for SmartArt graphics (SmartArt Styles) include edges, shadows, line styles, gradients and three-dimensional (3-D) perspectives. Try different combinations of SmartArt Styles and colours until you find one that matches the message that you want to communicate. You can pick a layout, a SmartArt Style, and a colour variation that you like, and then change the layout again — your SmartArt Style and colours will stay with your SmartArt graphic, so that you do not need to re-do them.

SmartArt Styles map the theme effects (theme effects: A set of visual attributes that is applied to elements in a file. Theme effects, theme colours and theme fonts compose a theme.) of the document themeto the shapes within the SmartArt graphic. For example, shapes might have thick lines or edges, while arrows might have a more subtle style applied to them. You can also apply colours from the theme colours of the document in different ways, such as changing the colour of the shape border. If you create multiple SmartArt graphics and want them to look alike, you can apply the same colours and SmartArt Style to achieve a consistent, professional look.

You can have shapes that display with edges, depth, and rotate in 3-D space. To make a SmartArt graphic three-dimensional, apply a 3-D SmartArt Style or manually apply a 3-D rotation to each shape. If the entire SmartArt graphic is three-dimensional (called scene coherent 3D), you can continue to edit the text and formatting of each of the individual shapes, but the shapes cannot be repositioned or resized. You can only reposition or resize shapes in a two-dimensional scene.

2D And 3D

To switch between 2-D and 3-D,

1. Under **SMARTARTTOOLS**, on the **FORMAT**ribbon, in the **SHAPES** group,
2. Click **EDIT IN 2-D**.

The **EDIT IN 2-D** button temporarily unlocks your SmartArt graphic for editing so that you can move and resize shapes—but the 3-D SmartArt Style is still applied to your SmartArt graphic and reappears when you click the **EDIT IN 2-D** button again. When your SmartArt graphic is displayed in a 3-D scene, you can rotate it as a whole and position light sources and the "camera" such that the entire SmartArt graphic appears to pop out of the screen.

SmartArt Styles affect an entire SmartArt graphic, while Quick Styles for Shapes (Shape Styles) affect only the selected shape. You can manually customize a shape by changing the colour, effects or border, or by replacing it with another shape. It is recommended that you customize your SmartArt graphic only after you settle on its content and layout, as some customizations are not transferred because they might not look good in the new layout.

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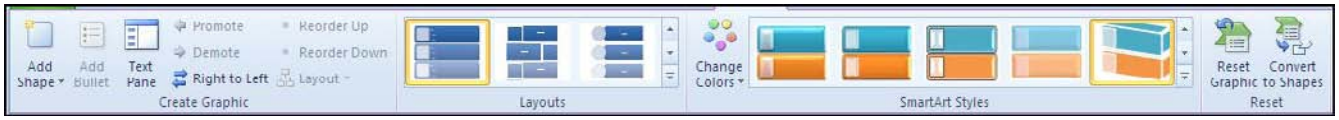
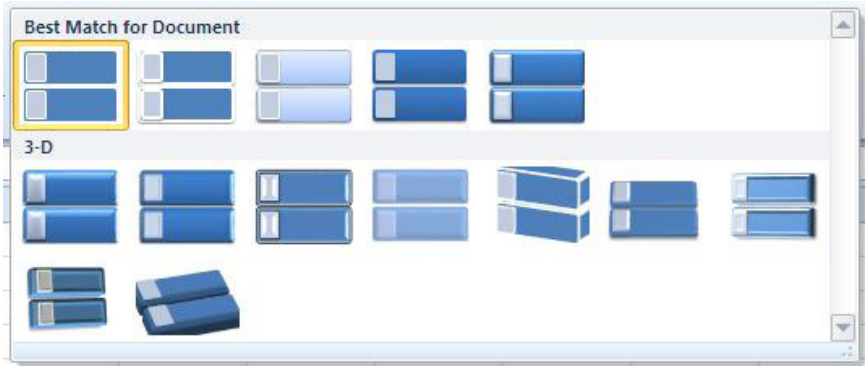
The Design Ribbon



The design ribbon contains a number of preset formats and design layouts for your SmartArt graphic you may use these either before or after you enter information into your SmartArt.



To change SmartArt style

Mouse

1. Select your SmartArt graphic to enable the design ribbon
2. Go to the **SmartArt styles** group and click on the down arrow to the right of it
3. Move your mouse over the different styles to see a preview of the style applied to your SmartArt.
4. When you have the style that best suits your needs click on it to apply it.

5. You may do this many times if you change your mind

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To change colour scheme

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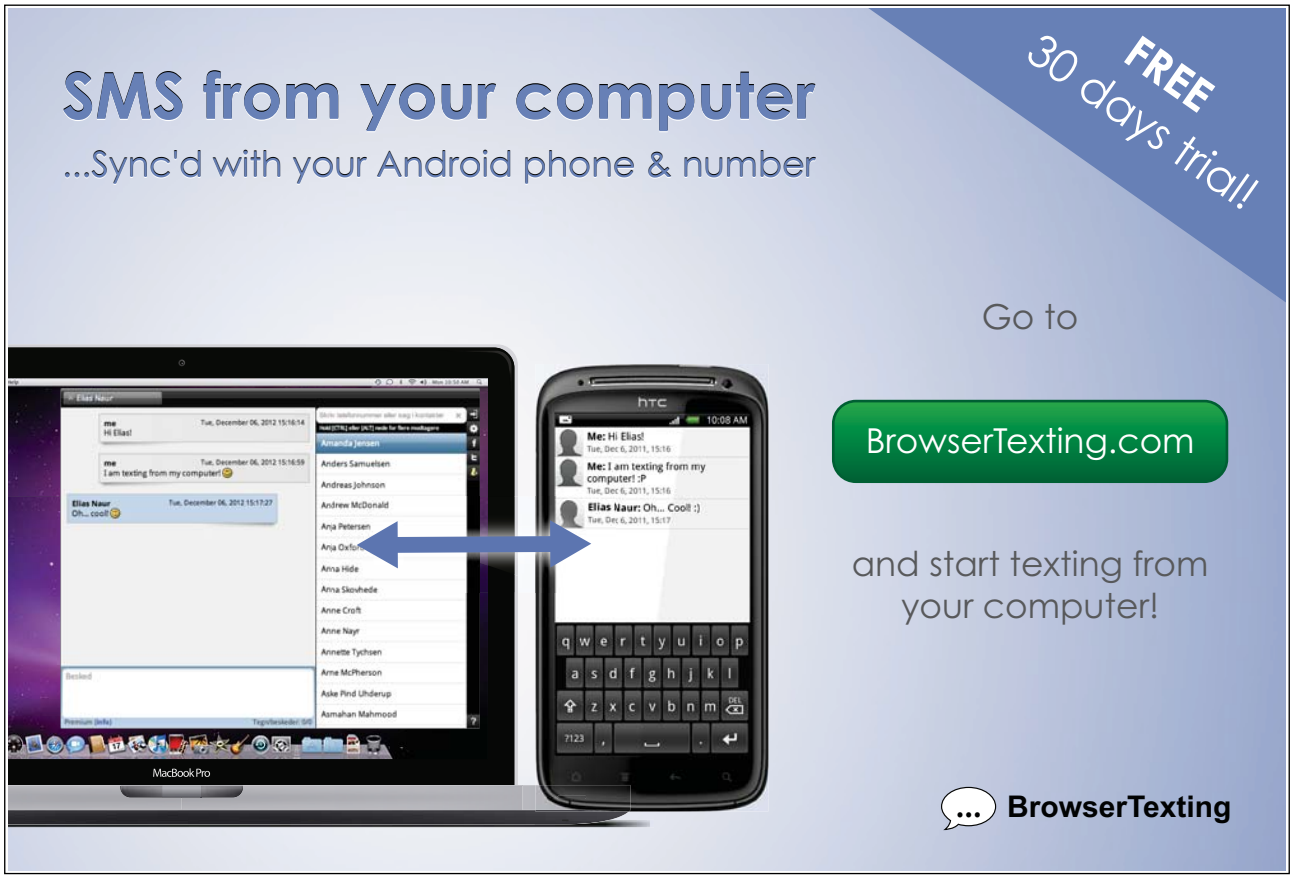

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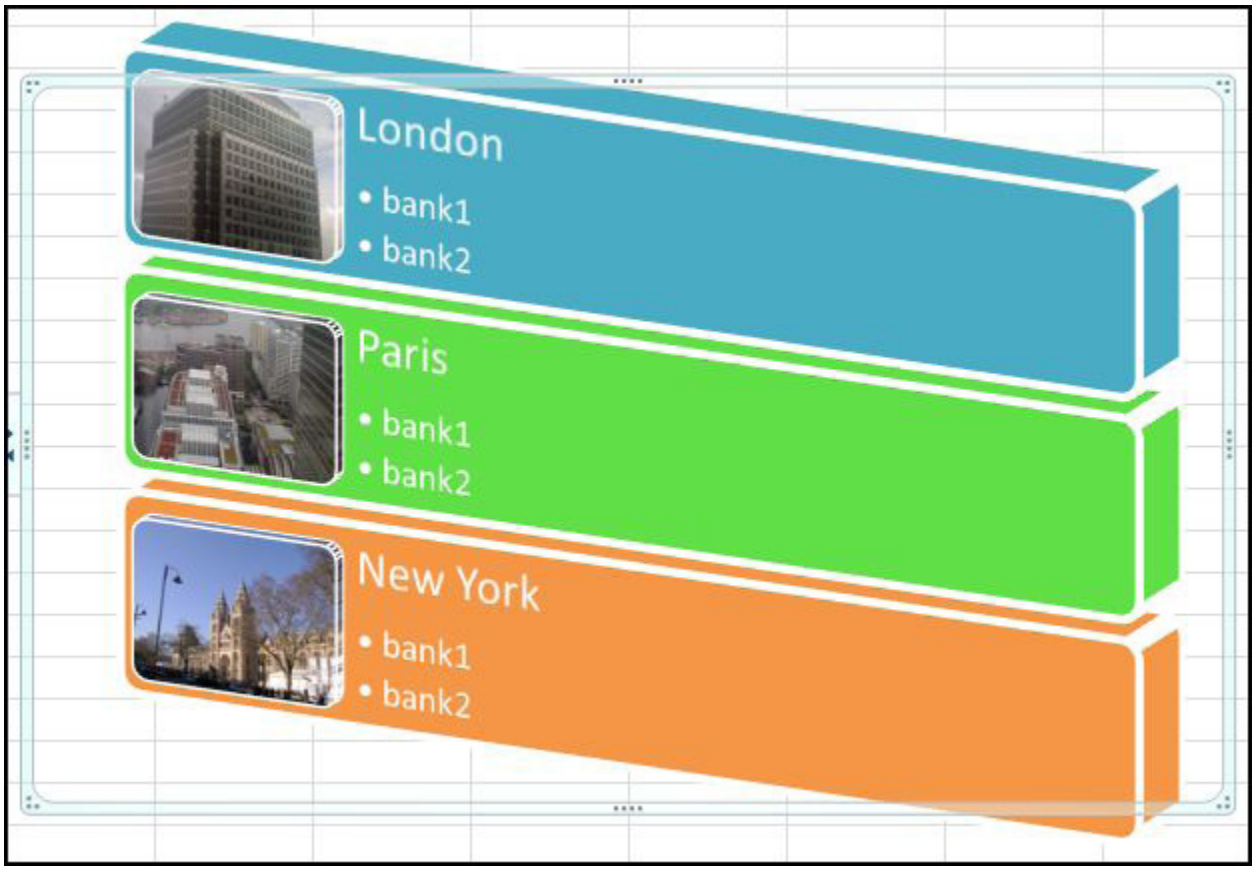
Mouse

1. Select your SmartArt graphic to enable the design ribbon
2. Click on the drop down arrow on the **CHANGE COLOURS** button
3. Move your mouse over the different colour schemes to see a preview of the colour schemes applied to your SmartArt.
4. When you have the colour schemes that best suits your needs click on it to apply it.
5. You may do this many times if you change your mind
6. To make small or large changes in the appearance of your SmartArt if you cannot find what you wish in the styles and colour schemes then you will have to go to the format ribbon and make the changes manually.



All drawing objects have similar options when it comes to formatting and we will look at the formatting shapes section.

WordArt

WordArt is a gallery of text styles that you can add to your 2010 Microsoft Office system documents to create decorative effects, such as shadowed or mirrored (reflected) text. You can change WordArt text, as you can change any other text in a shape.

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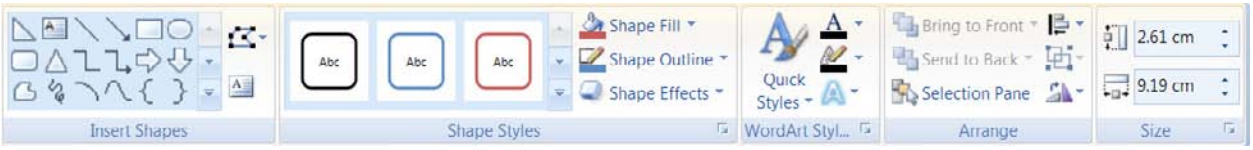
Mouse

1. On the **INSERT** ribbon, in the **TEXT** group, click **WORDART**, and then click the WordArt style that you want.
2. Enter your text.
3. A WordArt graphic can be resized, rotated, deleted and moved like any other shape.

Formatting Shapes

Any shape inserted on the spreadsheet, when selected, causes a new ribbon to appear called the **format** ribbon seen below, it offers the options of inserting further shapes. Formatting all aspects of the selected shape and fixing a specific size. The easiest method of formatting your shape is to use the QuickStyle option in the **shape styles** group



To apply a QuickStyle

Mouse

1. Select the shape or shapes you wish to apply a QuickStyle to.
2. As you move your mouse over the various options your shape on the worksheet will temporarily take on that format as a preview. See below.

Other theme fills

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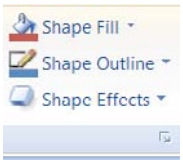
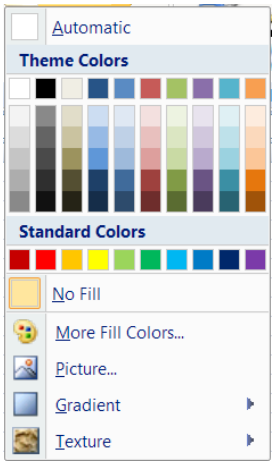
3. If you prefer to look at the other them fills option at the bottom you will be given the above options
4. When you locate the style you want click on it to apply it to your shape.

Manual Formatting

Manual formatting can be applied as well. Fill, border, 3D, rotation etc using various tools from the format ribbon. There are also tools for aligning, layering and sizing your shape as in a desktop publishing programme.





To change fill colour

Mouse

1. Select shape to be formatted select **FILL COLOUR** from the **SHAPE STYLES** group.
2. Select a **THEME COLOUR, STANDARD COLOUR, GRADIENT, TEXTURE, PICTURE** or **MORE FILL COLOURS**.
3. ***more fill colours gives a palette with any possible colour you may require. You may match a colour if you know the* RGB *or* CYMK *numbers)***

To change a border

Mouse

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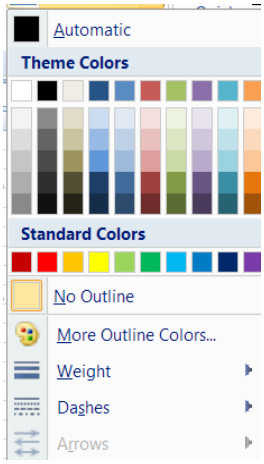

1. Select shape to be formatted select **SHAPE OUTLINE** from the shape STYLES GROUP.
2. Select a **THEME COLOUR, STANDARD COLOUR** or **MORE OUTLINE COLOURS.**

when you have selected a colour for your shapes outline you may wish to make it thicker or to have a dashed style. Repeat step one and select weight or dashes and make a selection to apply to your shape.

The arrows option is available if your shape happens to be any kind of line you may choose an arrow style as well as a weight and line style

To apply shape effects

Mouse

1. Select shape to be formatted. Click on shape effects to see menu on right
2. The preset menu shows popular styles made up of the other menu choices. Select a preset to apply.
3. You may alter aspects of the preset by repeating and selecting a different menu choice.

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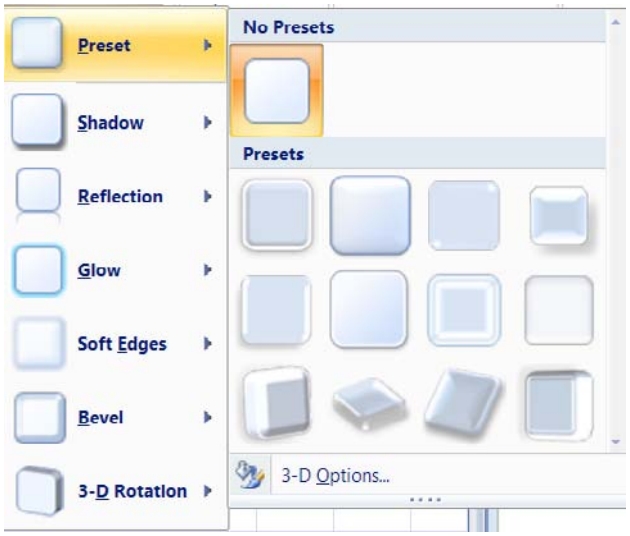

Using all formatting choices shown gives a very professional finish to any object placed on the worksheet many of these options are available for charts and pictures.

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More Formatting

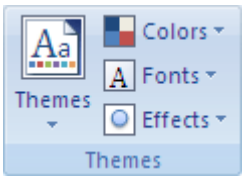
Themes

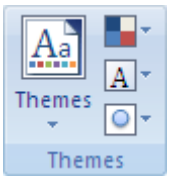
You can quickly and easily format an entire document to give it a professional and modern look by applying a document theme (A set of unified design elements that provides a look for your document by using colour, fonts and graphics.). A document theme is a set of formatting choices that include a set of theme colours, a set of theme fonts (including heading and body text fonts), and a set of theme effects (including lines and fill effects).

Excel provides several predefined document themes, but you can also create your own by customizing an existing document theme, and then by saving it as a custom document theme. Document themes are shared across Office programs so that all of your Office documents can have the same, uniform look.

To Apply a document theme

You can change the document theme that is applied by default in Office programs, such as Word, Excel and PowerPoint, by selecting another predefined document theme or a custom document theme. Document themes that you apply immediately affect the styles (A combination of formatting characteristics, such as font, font size, and indentation, that you name and store as a set. When you apply a style, all of the formatting instructions in that style are applied at one time.) that you can use in your document.





Mouse

1. On the **PAGE LAYOUT** ribbon, in the **THEMES** group, click **THEMES**.
2. To apply a predefined document theme, click the document theme that you want to use under **BUILT-IN.**
3. To apply a custom document theme, click the document theme that you want to use under **CUSTOM**.

Custom is available only if you created one or more custom document themes

4. If a document theme that you want to use is not listed, click **BROWSE FOR THEMES** to find it on your computer or a network location.

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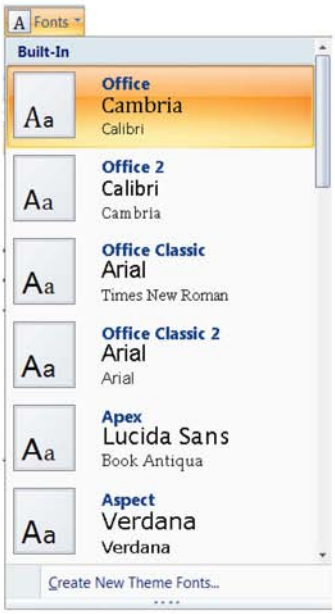
5. To search for other document themes on Office Online, click **SEARCH OFFICE ONLINE**.

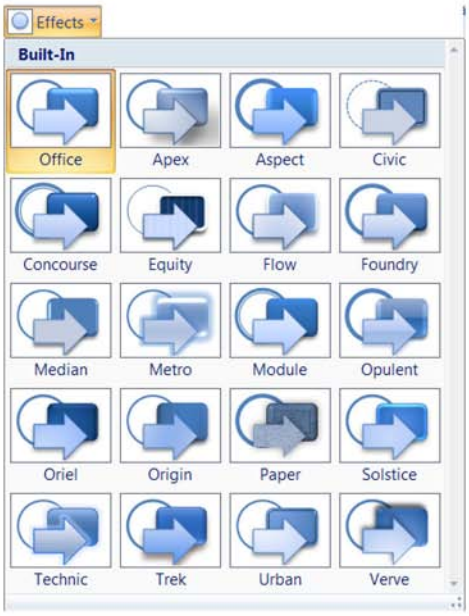
Customising A Theme

1. The collection of fonts, colours and effects that make up a theme can all be customised and then saved as a custom theme

To customise a theme

1. Click on the drop down arrow next to the aspect of the theme you wish to change colours, fonts or effects.





2. Make a selection from the choices present.
3. Click on **THEMES** and **SAVE CURRENT THEME.**

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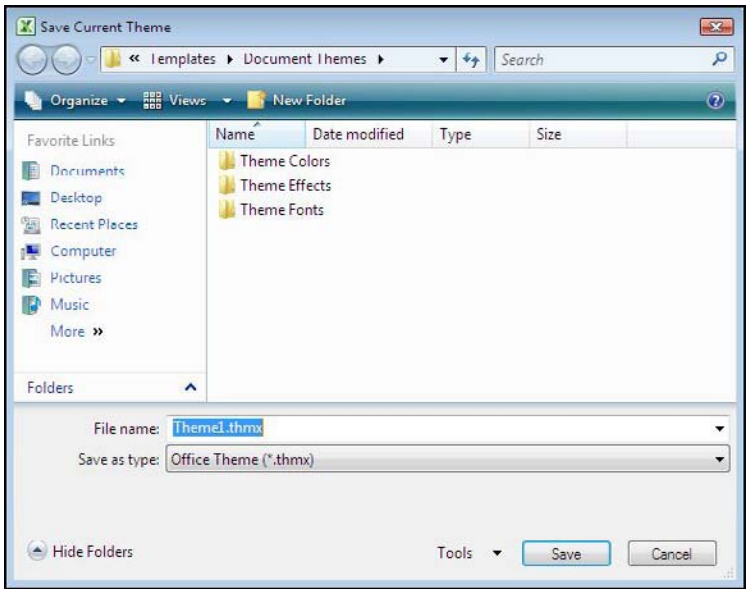

4. Clicking on the **THEMES** button in future will display **CUSTOM**, to allow you to use this theme in future workbooks.

To set custom colour schemes for a theme

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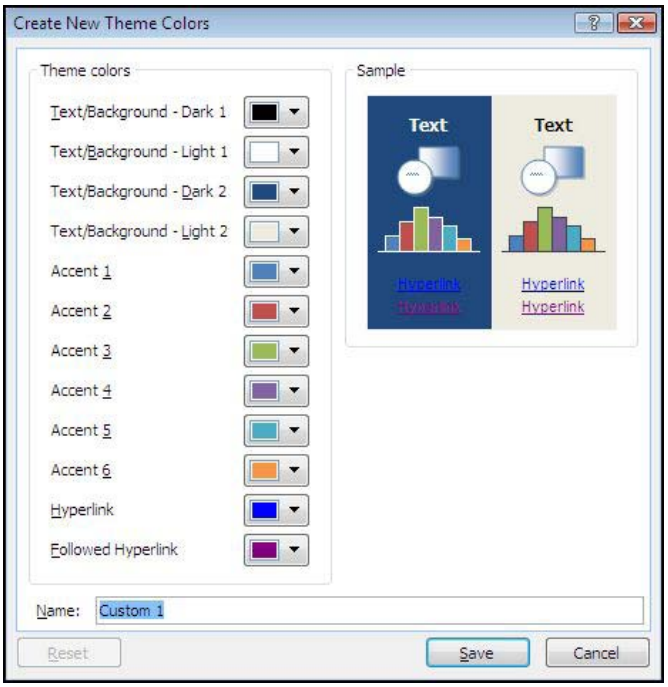
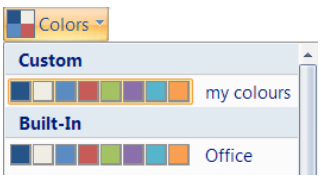
Mouse

1. Click on the drop down arrow next to the **COLOURS** button.
2. Select **CREATE NEW THEME COLOURS** at the bottom of the menu
3. The dialog above is displayed
4. Select new colours for the various parts of your theme. A sample is shown on the right to show you how the colours appear together



5. Enter a name for your colour scheme in the **NAME** box
6. Click on **SAVE**.
7. Next time you click on the colours button it will display **CUSTOM** and the sets of colours you have created.



To create custom font schemes for a theme.

Mouse

1. Click on the drop down arrow next to the **FONTS** button.

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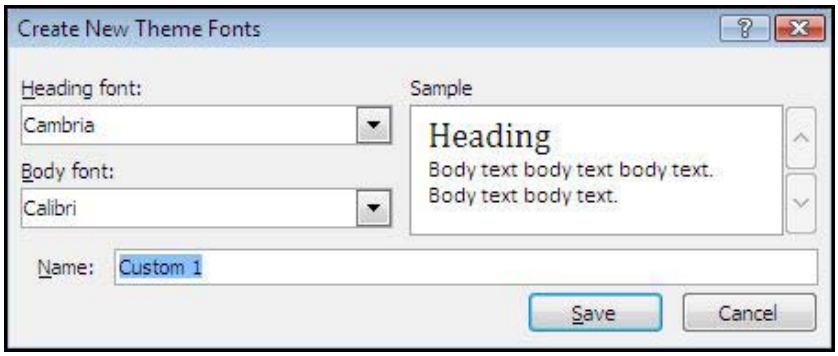
2. Select **create NEW THEME FONTS** at the bottom of the menu



3. The dialog to the right is displayed
4. Select Fonts for the heading and a font for the body text see sample on right of dialog.
5. Enter a name for your font scheme in the **NAME** box
6. Click on **SAVE**.
7. Next time you click on the **FONTS** button it will display **CUSTOM** and the sets of fonts you have created.

Cell Styles

To apply several formats in one step, and to ensure that cells have consistent formatting, you can use a cell style. A cell style is a defined set of formatting characteristics, such as fontsand font sizes, number formats, cell borders and cell shading. To prevent anyone from making changes to specific cells, you can also use a cell style that locks cells.Microsoft Office Excel has several built-in cell styles that you can apply or modify. You can also modify or duplicate a cell style to create your own, custom cell style.

Cell styles are based on the document theme that is applied to the entire workbook. When you switch to another document theme, the cell styles are updated to match the new document theme.

How to select cells, ranges, rows, or columns

To select	Do this
A single cell	Click the cell, or press the arrow keys to move to the cell.

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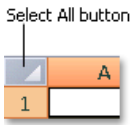
A range of cells	Click the first cell in the range, and then drag to the last cell, or hold down **SHIFT** while you press the arrow keys to extend the selection. You can also select the first cell in the range, and then press **F8** to extend the selection by using the arrow keys. To stop extending the selection, press **F8** again.
A large range of cells	Click the first cell in the range, and then hold down **SHIFT** while you click the last cell in the range. You can scroll to make the last cell visible.
All cells on a worksheet	Click the **Select All** button. To select the entire worksheet, you can also press **CTRL+A.** If the worksheet contains data, **CTRL+A** selects the current region. Pressing **CTRL+A** a second time selects the entire worksheet. 
Nonadjacent cells or cell ranges	Select the first cell or range of cells, and then hold down **CTRL** while you select the other cells or ranges. You can also select the first cell or range of cells, and then press **SHIFT+F8** to add another nonadjacent cell or range to the selection. To stop adding cells or ranges to the selection, press **SHIFT+F8** again. You cannot cancel the selection of a cell or range of cells in a nonadjacent selection without cancelling the entire selection.
An entire row or column	You can also select cells in a row or column by selecting the first cell and then pressing **CTRL+SHIFT+ARROW** key (**RIGHT ARROW** or **LEFT ARROW** for rows, **UP ARROW** or **DOWN ARROW** for columns).If the row or column contains data, **CTRL+SHIFT+ARROW** key selects the row or column to the last used cell. Pressing **CTRL+SHIFT+ARROW** key a second time selects the entire row or column.
Adjacent rows or columns	Drag across the row or column headings. Or select the first row or column; then hold down **SHIFT** while you select the last row or column.
Nonadjacent rows or columns	Click the column or row heading of the first row or column in your selection; then hold down **CTRL** while you click the column or row headings of other rows or columns that you want to add to the selection.
The first or last cell in a row or column	Select a cell in the row or column, and then press **CTRL+ARROW** key (**RIGHT ARROW** or **LEFT ARROW** for rows, **UP ARROW** or **DOWN ARROW** for columns).
The first cell on a worksheet	Press **CTRL+HOME** to select the first cell on the worksheet or in an Excel list.
Last used cell on the sheet (lower-right corner)	Select the first cell, and then press **CTRL+SHIFT+END** to extend the selection of cells to the last used cell on the worksheet (lower-right corner).
Cells to the beginning of sheet	Select the first cell, and then press **CTRL+SHIFT+HOME** to extend the selection of cells to the beginning of the worksheet.

To cancel a selection of cells, click any cell on the worksheet.

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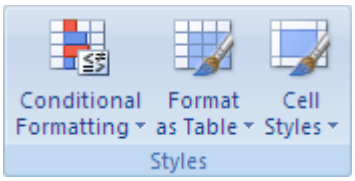
To Apply a cell style



Mouse

1. Select the cells that you want to format.
2. On the **Home**ribbon, in the **Styles** group, click **Cell Styles**.
3. Click the cell style that you want to apply from the QuickStyles displayed.

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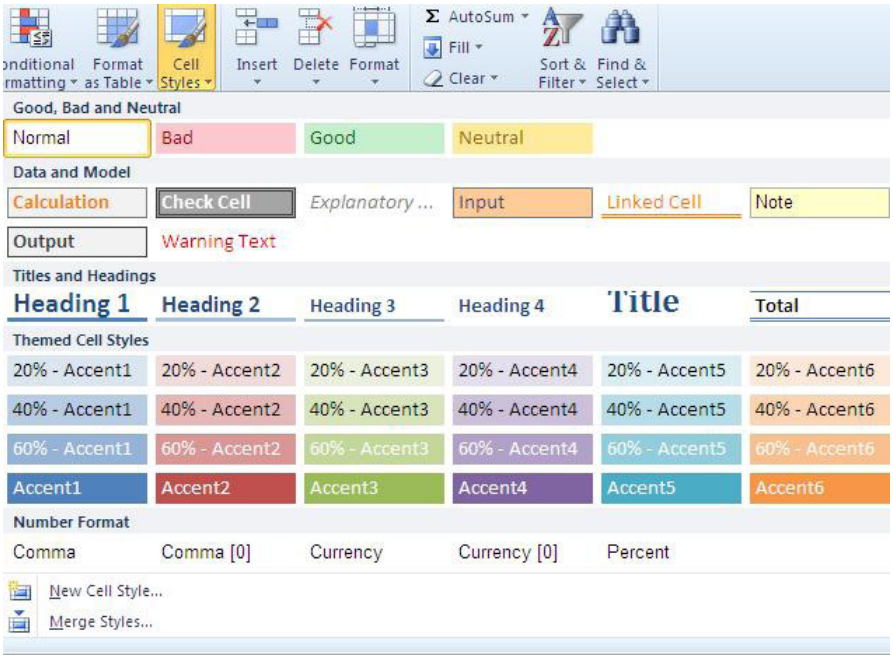

To create custom cell style

Mouse

On the **HOME** ribbon, in the **STYLES** group, click **CELLSTYLES**.

Click **NEW CELL STYLE**.

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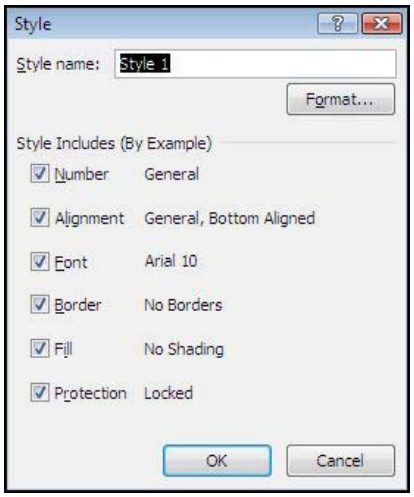

In the **STYLE NAME** box, type an appropriate name for the new cell style.

On the various tabs in the **FORMAT CELLS** dialog box, select the formatting that you want, and then click **OK**.

In the **STYLE** dialog box, under **STYLE INCLUDES (BY EXAMPLE),** clear the check boxes for any formatting that you don't want to include in the cell style.

Click **Format**. To open the **FORMAT** dialog

Choose formatting options as you would normally would from each tab in **FORMAT** dialog

Click **OK** to close **FORMAT** dialog

Click **OK** to create and apply the style

To remove a cell style

Mouse

1. On the **HOME** ribbon, in the **STYLES** group, click **CELL STYLES**.
2. To remove the cell style from the selected cells without deleting the cell style, choose the normal style this will remove all formatting from the cell,
3. To delete a created cell style the access the QuickStyles list.
4. Right click on desired cell style, choose delete.

You cannot delete the* NORMAL *cell style.

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Conditional Formatting

- Whenever you analyze data, you often ask yourself questions, such as:
- *Where are the exceptions in a summary of profits over the past five years?*
- *What are the trends in a marketing opinion poll over the past two years?*
- *Who has sold more than £50,000 this month?*
- *What is the overall age distribution of employees?*
- *Which products have greater than 10% revenue increases from year to year?*
- *Who are the highest performing and lowest performing students in the new student class?*

Conditional formatting helps to answer these questions by making it easy to highlight interesting cells or ranges of cells, emphasize unusual values, and visualize data by using data bars, colour scales and icon sets. A conditional format changes the appearance of a cell range based on a condition (or criteria). If the condition is true, the cell range is formatted based on that condition; if the conditional is false, the cell range is not formatted based on that condition.

When creating a conditional format, you can reference other cells in a worksheet, such as =FY2006!A5, but you cannot use external references to another workbook.

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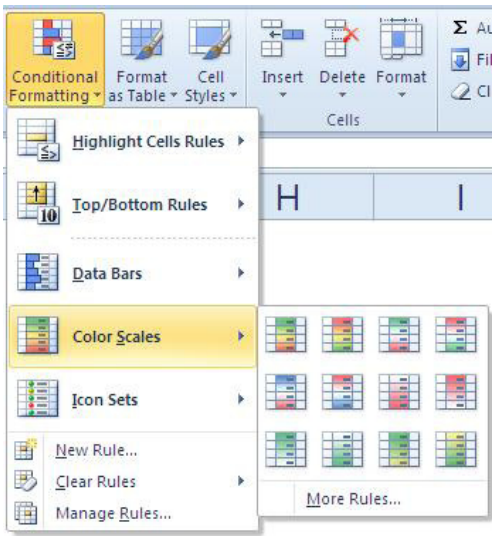
To Format all cells by using a two-colour scale

Colour scales are visual guides that help you understand data distribution and variation. A two-colour scale helps you compare a range of cells by using a gradation of two colours. The shade of the colour represents higher or lower values. For example, in a green and red colour scale, you can specify higher value cells have a greener colour and lower value cells have a redder colour.



Mouse

1. Select a range of cells, or make sure that the active cell is in a table or PivotTable report.
2. On the **HOME** ribbon, in the **STYLES** group, click the arrow next to **CONDITIONAL FORMATTING**, and then click **COLOUR SCALES.**
3. Select a two-colour scale.

Hover over the colour scale icons to see which one is a two-colour scale. The top colour represents higher values and the bottom colour represents lower values.

Other conditional format options

Although we looked at the two colour scale to apply there are other options you may wish to apply. It will obviously depend on what data you have and how you wish to show it, which of these sets of conditional formatting QuickStyles you wish to choose.

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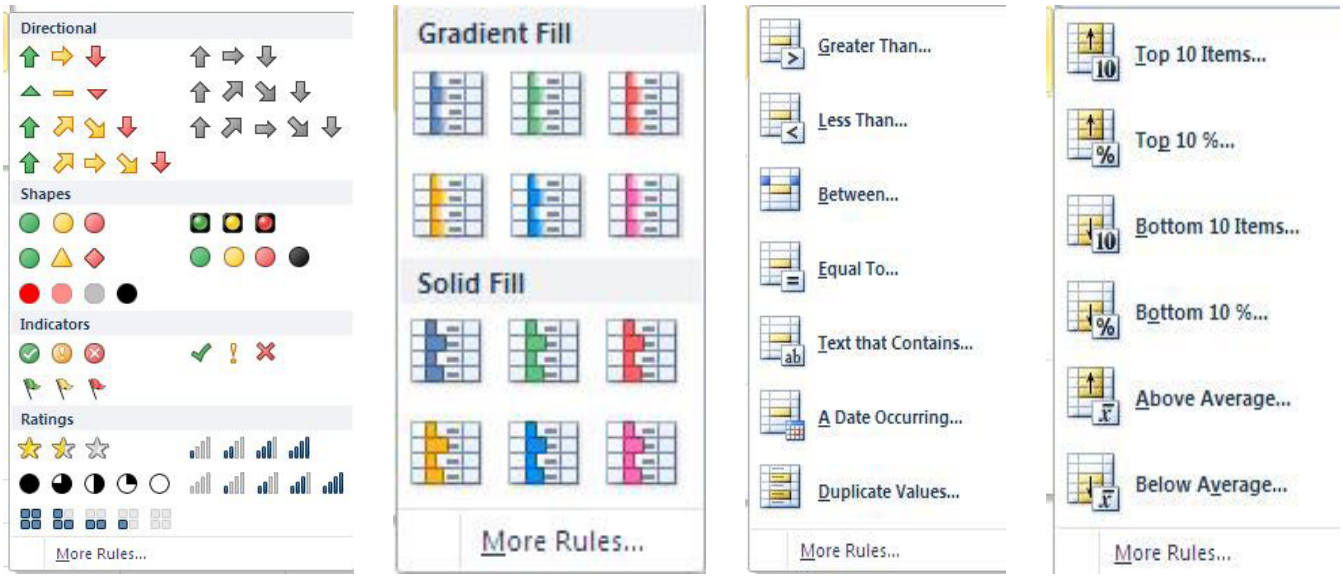

More rules

If you cannot find what you wish with all those options then you will have to create your own by creating your own rule

To manage rules for advanced formatting.

Mouse

1. Select a range of cells, or make sure that the active cell is in a table or PivotTable report.
2. On the **HOME** ribbon, in the **Styles** group, click the arrow next to **CONDITIONAL FORMATTING**, and then click **MANAGE RULES**.
3. The **CONDITIONAL FORMATTING RULES MANAGER** dialog box is displayed.

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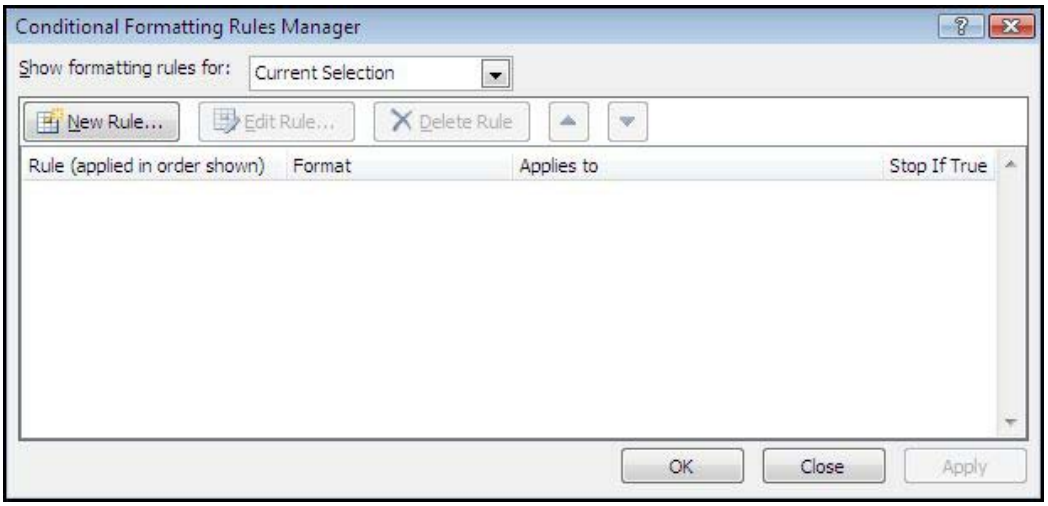

To add a conditional format (new rule).

Mouse

1. lick **NEW RULE.** The **NEW FORMATTING RULE** dialog box is displayed.
2. Select a rule type from top section of dialog.
3. Edit the rule description in bottom section.

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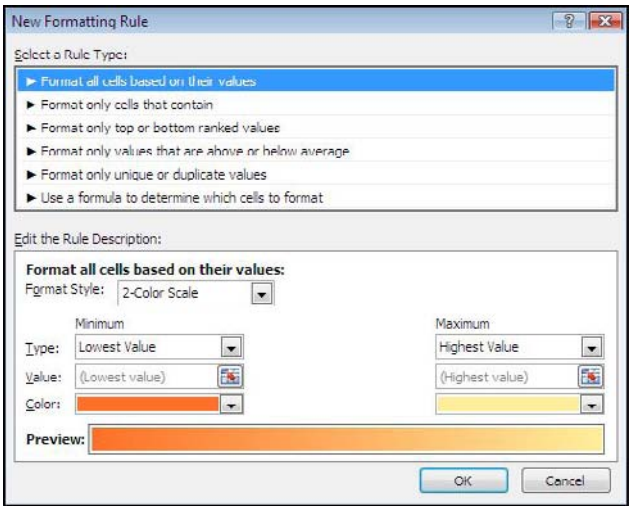

New Formatting Rule
Select a Rule Type:
► Format all cells based on their values
► Format only cells that contain
► Format only top or bottom ranked values
► Format only values that are above or below average
► Format only unique or duplicate values
► Use a formula to determine which cells to format
Edit the Rule Description:
Format all cells based on their values:
Format Style: 2-Color Scale
Minimum
Maximum
Type: Lowest Value
Highest Value
Value: (Lowest value)
(Highest value)
Color:
Preview:
OK
Cancel

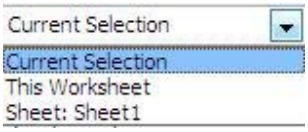
- *Rule descriptions will change dependent on the rule type.*

4. Select the colours you wish to apply if the conditions you have set are met.
5. Click **OK** to create the rule the rule will then appear in the **RULE MANAGER.**
6. Click **OK** to apply the rule and close the **RULE MANAGER**

To conditionally format to two colour scale(advanced)

Mouse

1. On the **HOME** ribbon, in the **Styles** group, click the arrow next to **CONDITIONAL FORMATTING**, and then click **MANAGE RULES**.



2. The **CONDITIONAL FORMATTING RULES MANAGER** dialog box is displayed.

3. Make sure that the appropriate worksheet or table is selected in the **SHOW FORMATTING RULES FOR** list box.

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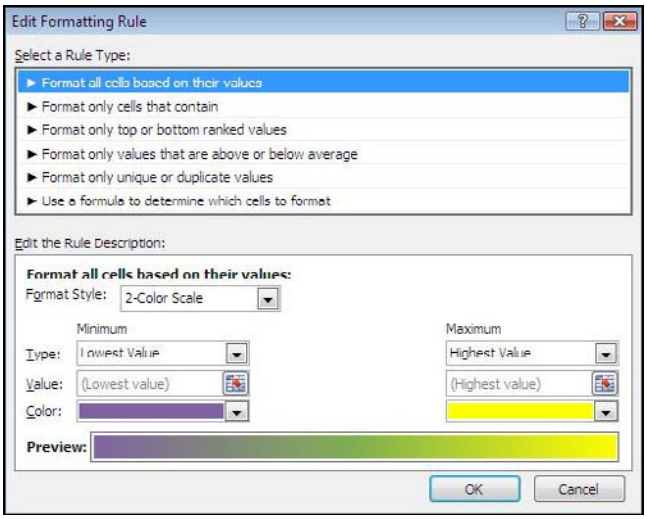
4. Optionally, change the range of cells by clicking **COLLAPSE DIALOG** in the **APPLIES to** box to temporarily hide the dialog box, selecting the new range of cells on the worksheet, and then selecting **EXPAND DIALOG**.
5. Select the rule, and then click **EDIT RULE**. The **EDIT FORMATTING RULE** dialog box is displayed.


Edit Formatting Rule
Select a Rule Type:
► Format all cells based on their values
► Format only cells that contain
► Format only top or bottom ranked values
► Format only values that are above or below average
► Format only unique or duplicate values
► Use a formula to determine which cells to format
Edit the Rule Description:
Format all cells based on their values:
Format Style: 2-Color Scale
Minimum
Maximum
Type: Lowest Value
Highest Value
Value: (Lowest value)
(Highest value)
Color:
Preview:
OK
Cancel

6. Under **SELECT A RULE TYPE**, click **FORMAT ALL CELLS BASED ON THEIR VALUES**.
7. Under **EDIT THE RULE DESCRIPTION**, in the **FORMAT STYLE** list box, select **2-COLOR SCALE**.
8. Select a **MINIMUM** and **MAXIMUM TYPE**

- ***Format lowest and highest values****Select Lowest Value and Highest Value. In this case, you do not enter a Minimum and Maximum Value.*
- ***FORMAT A NUMBER****, date, or time value**Select Number, and then enter a Minimum and Maximum Value.*
- ***FORMAT A PERCENTAGE*** *Select Percent, and then enter a Minimum and Maximum Value.Valid values are from 0 to 100. Do not enter a percent sign.Use a percentage when you want to visualize all values proportionally because the distribution of values is proportional.*
- ***FORMAT A PERCENTILE*** *Select Percentile and then enter a Minimum and Maximum Value. Valid percentiles are from 0 to 100. You cannot use a percentile if the range of cells contains more than 8,191 data points.Use a percentile when you want to visualize a group of high values (such as the top 20thpercentile) in one colour grade proportion and low values (such as the bottom 20th percentile) in another colour grade proportion, because they represent extreme values that might skew the visualization of your data.*
- ***FORMAT A FORMULA RESULT*** *Select Formula, and then enter a Minimum and Maximum Value. The formula must return a number, date or time value. Start the formula with an equal sign (=). Invalid formulas result in no formatting applied. It's a good idea to test the formula in the worksheet to make sure that it doesn't return an error value.*

Minimum and Maximum values are the minimum and maximum values for the range of cells. Make sure that the Minimum value is less than the Maximum value.

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You can choose a different Minimum and MaximumType. For example, you can choose a MinimumNumber and MaximumPercent.

9. To choose a **MINIMUM** and **MAXIMUM** colour scale, click **COLOUR** for each, and then select a colour. If you want to choose additional colours or create a custom colour, click **MORE COLOURS**.
10. The colour scale that you select is displayed in the **PREVIEW** box.
11. Click **OK** to return to the rule manager
12. Click **OK** to apply the new rule to selected cells and close rule manager.

To Format all cells by using data bars quick formatting

110	175	140	250
105	210	240	300
210	180	295	200
110	200	125	250
95	195	185	275

A data bar helps you see the value of a cell relative to other cells. The length of the data bar represents the value in the cell. A longer bar represents a higher value and a shorter bar represents a lower value. Data bars are useful in spotting higher and lower numbers especially with large amounts of data, such as top and bottom selling toys in a holiday sales report.

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Mouse

1. Select a range of cells, or make sure that the active cell is in a table or PivotTable report.
2. On the **HOME** ribbon, in the **Style** group, click the arrow next to **CONDITIONAL FORMATTING**, click **DATA BARS** and then select a data bar icon.

To Format all cells by using data bars advanced formatting

Mouse

Select a range of cells, or make sure that the active cell is in a table or PivotTable report.

On the **HOME**ribbon, in the **STYLES** group, click the arrow next to **CONDITIONAL FORMATTING**, and then click **MANAGE RULES.**The Conditional Formatting **RULES MANAGER** dialog box is displayed.

Either

To add a conditional format, click **NEW RULE**. The **NEW FORMATTING RULE** dialog box is displayed.

OR

1. To change a conditional format, Make sure that the appropriate worksheet or table is selected in the **SHOW FORMATTING RULES FOR** list box.
2. Optionally, change the range of cells by clicking **COLLAPSE DIALOG** in the **APPLIES to** box to temporarily hide the dialog box, selecting the new range of cells on the worksheet, and then selecting **EXPAND DIALOG**.

3. Select the rule, and then click **EDIT RULE**. The **EDIT FORMATTING RULE** dialog box is displayed.

4. Under **SELECT A RULE TYPE**, click **FORMAT ALL CELLS BASED ON THEIR VALUES**.
5. Under **EDIT THE RULE DESCRIPTION**, in the **FORMAT STYLE** list box, select **DATA BAR.**
6. Select a Shortest Bar and Longest Bar Type.

- ***Format lowest and highest values****Select Lowest Value and Highest Value. In this case, you do not enter a Shortest Bar and Longest Bar Value.*
- ***Format a number, date, or time value****Select Number, and then enter a Shortest Bar and Longest Bar Value.*
- ***Format a percentage*** *Select Percent, and then enter a Shortest Bar and Longest Bar Value. Valid values*

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are from 0 to 100. Do not enter a percent sign.Use a percentage when you want to visualize all values proportionally because the distribution of values is proportional.

- ***Format a percentile*** *Select Percentile and then enter a Shortest Bar and Longest Bar Value. Valid percentiles are from 0 to 100. You cannot use a percentile if the range of cells contains more than 8,191 data points.Use a percentile when you want to visualize a group of high values (such as the top 20th percentile) in one data bar proportion and low values (such as the bottom 20th percentile) in another data bar proportion, because they represent extreme values that might skew the visualization of your data.*
- ***Format a formula*** *result Select Formula, and then enter a Shortest Bar and Longest Bar Value. The formula must return a number, date or time value. Start the formula with an equal sign (=). Invalid formulas result in no formatting applied. It's a good idea to test the formula in the worksheet to make sure that it doesn't return an error value.*

Make sure that the Shortest Bar value is less than the Longest Bar value.

You can choose a different Shortest Bar and Longest BarType. For example, you can choose a Shortest BarNumber and Longest BarPercent.To choose a Shortest Bar and Longest Bar colour scale, click Bar Colour. If you want to choose additional colours or create a custom colour, click More Colours.The bar colour that you select is displayed in the Preview box. To show only the data bar and not the value in the cell, select Show Bar Only.

To Clear conditional formats (worksheet)

Mouse

1. On the **HOME** ribbon, in the **STYLES** group, click the arrow next to **CONDITIONAL FORMATTING**, and then click **CLEAR RULEs.**
2. Click **ENTIRE SHEET**.

To Clear conditional formats (A range of cells, table, or PivotTable)

Mouse

1. Select the range of cells, table or PivotTable for which you want to clear conditional formats.
2. On the **Home**ribbon, in the **Styles** group, click the arrow next to **Conditional Formatting**, and then click **Clear Rules**.
3. Depending on what you have selected, click **Selected Cells, This TABLE** or **This PivotTable**.

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7 Excel tools

Objectives

By the end of this section you will be able to:

- Use tools to check your calculations
- Share your workbook with others
- Track changes and protect your workbook
- Use proofing tools to check and correct your document

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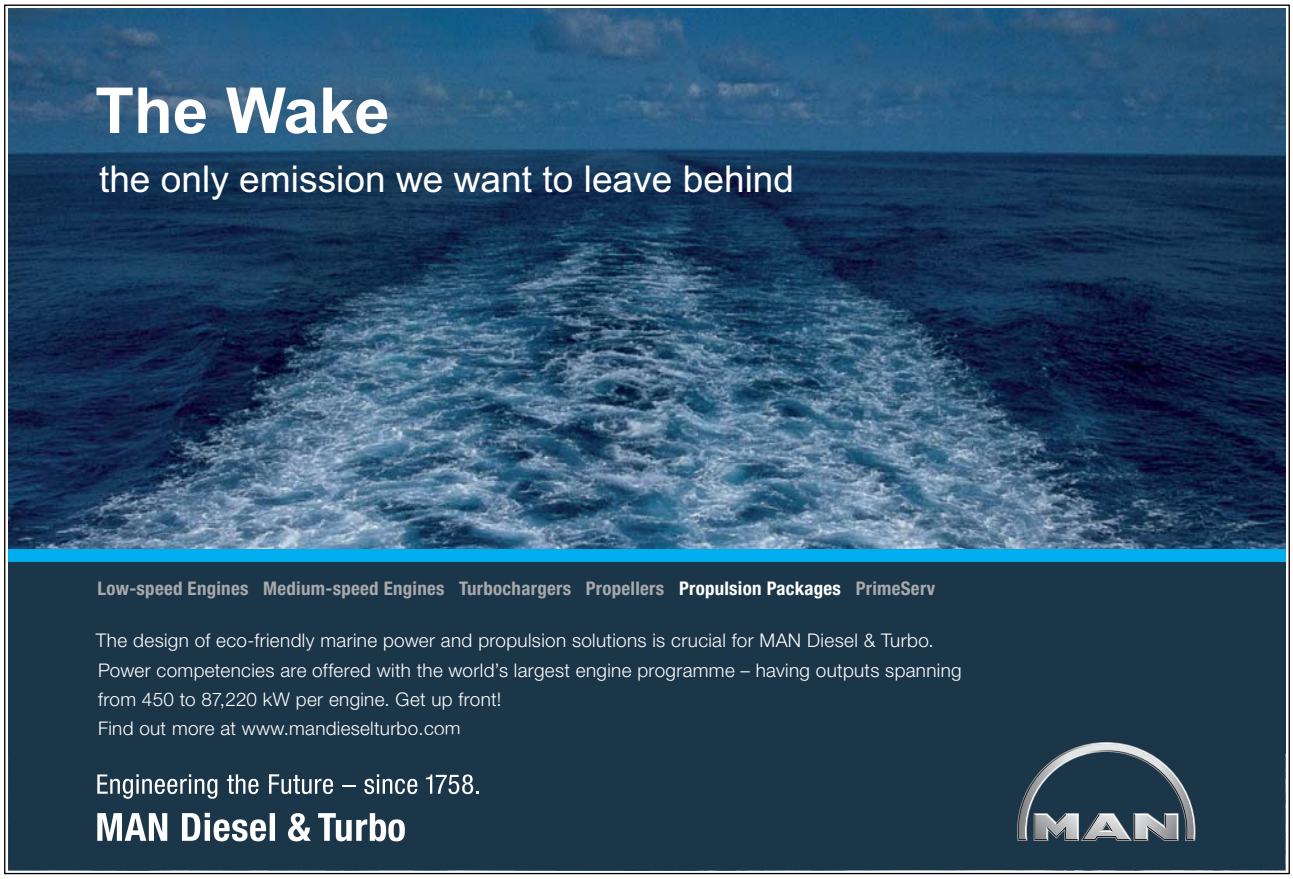
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Reviewing

Comments

When a cell has a comment attached, CellTips automatically display the comments added when the mouse pointer rests over the cell. You can tell which cells have comments attached as they have a comment indicator (a small red corner triangle).

To add a comment:

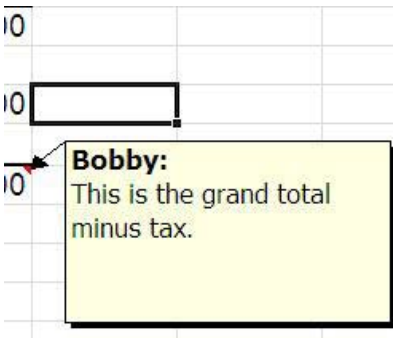
Mouse

1. Click in the cell where you want to insert a comment.
2. Choose **NEW COMMENT** from the **review** ribbon, **COMMENTS** group

3. In the text box that appears attached to the cell, type your comment.
4. Click outside the text box to confirm the entry and close the text box.

To view comments:

Mouse



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1. Position your mouse over the top of the cell that contains the comment. Shown with a tiny coloured triangle in top of the cell corner.
2. Your comment will be displayed as a Cell Tip.

To edit comments:

Mouse

1. Click in the cell where you want to edit a comment.
2. Choose **EDIT COMMENT** from the **REVIEW** ribbon
3. In the text box edit your comment.
4. Click outside the text box to confirm the entry and close the text box.

Hiding and redisplaying comments:

Mouse

1. You can hide an individual comment by clicking the right mouse button over the cell that contains the comment and choosing **SHOW/HIDE COMMENT** from the shortcut menu.
   OR

2. Click on **SHOW/HIDE COMMENTS** in the **COMMENTS** group on the **review** ribbon
3. When you want to redisplay all individually hidden **COMMENTS** click on **SHOW ALL COMMENTS** in the **COMMENTS** group on the **review** ribbon

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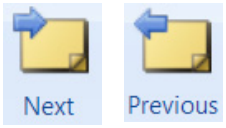
Reviewing comments:

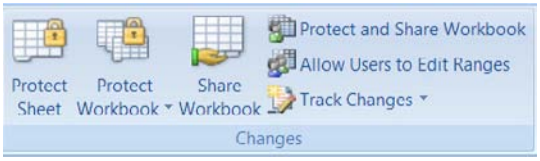
Mouse

1. Go to the **COMMENTS**GROUP on the **REVIEW** ribbon.



2. To view each comment in sequence click the **NEXT COMMENT** button.
3. To view the comments in reverse order, click the **PREVIOUS COMMENT** button.

Protecting



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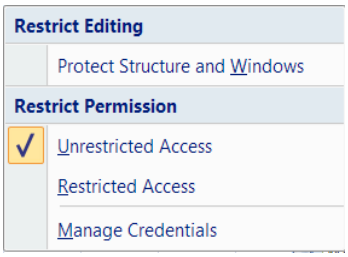
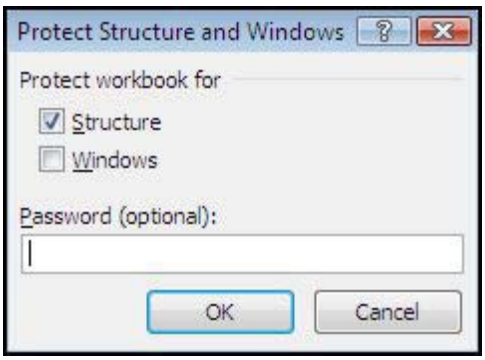
When sending your work to someone else to check, make corrections or comments it is necessary to track the changes that others may make to your work to see what changes they have made as they review your work. You may also want to restrict what they are allowed to do to your work so they do not inadvertently damage formulae and functions that make the workbook produce valid figures. For these reasons we may have to protect the workbook in various ways.

To protect a workbook



Protecting a workbook ensures individuals cannot, insert, delete, move or otherwise tamper with the sheets in your work book. Hidden sheets will not be able to be unhidden if valuable tables or data is stored on them.

Mouse



1. Click on **PROTECT WORKBOOK** in the **CHANGES** group on the **REVIEW** ribbon
2. Select **PROTECT STRUCTURE AND WINDOWS** the following dialog will appear.
3. For security (not essential) enter a password and click on **OK**. Workbook structure is now protected.

To unprotect a workbook

Mouse

1. Click on **PROTECT WORKBOOK** in the **CHANGES** group on the **REVIEW** ribbon
2. Select **UNPROTECT STRUCTURE AND WINDOWS** a dialog will appear asking for password if one was used.

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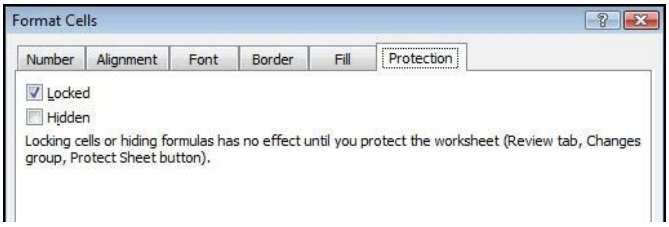
3. Enter password, click on **OK**, workbook is now unprotected

Protect worksheet data

Mouse

1. Select all cells you would like individuals to be allowed to change.
2. On the **HOME** ribbon, in the **Cells** group, click **FORMAT**, and then click **FORMAT CELLS**.



3. Click on the protection tab

4. Untick **LOCK CELLS**.

OR

1. On the **HOME** ribbon, in the **CELLS** group, click **FORMAT** then click on the **LOCK CELL** button to unlock selected cells.
2. Click on **PROTECT WORKSHEET** in the **CHANGES** group on the **REVIEW** ribbon.
3. Tick what you wish users to be allowed to do in your workbook.
4. Enter a password if you wish
5. Click on **OK.**
6. Sheet is now protected any cell that was locked is now uneditable by anyone.

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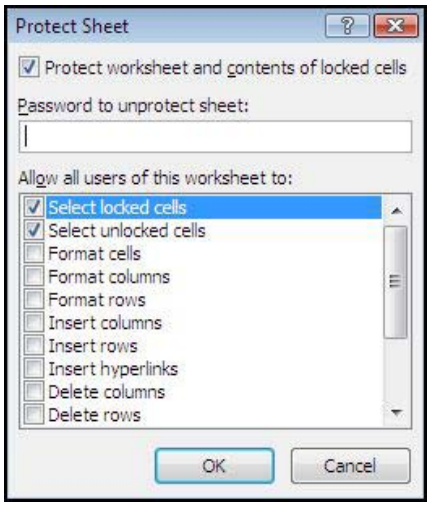

To unprotect worksheet data

Mouse

1. Click on **PROTECT WORKSHEET** in the **CHANGES** group on the **REVIEW** ribbon
2. Enter password to unprotect sheet if one was used.
3. Click **OK**

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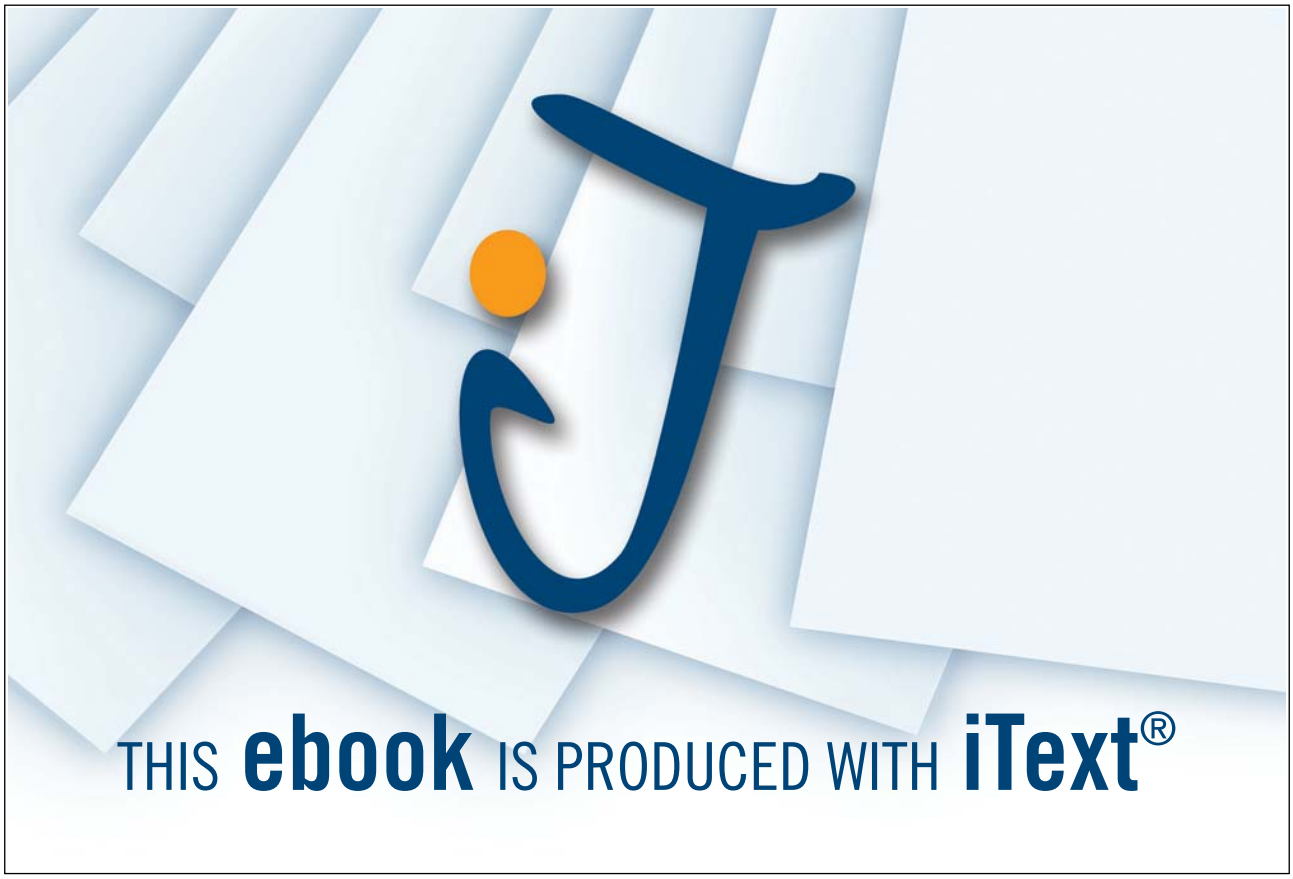

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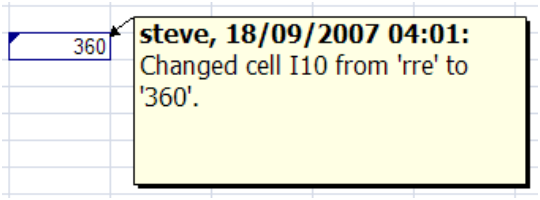
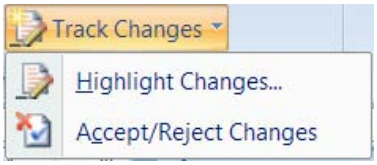
Tracking

To protect for tracked changes

Mouse

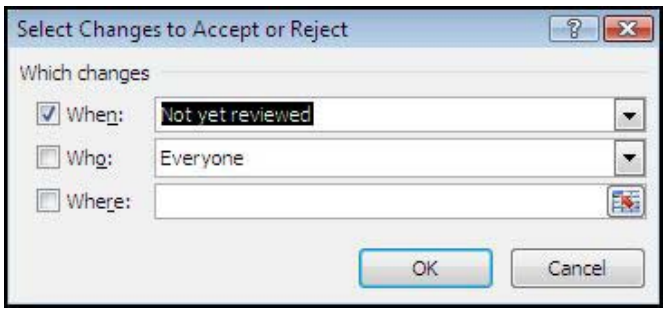
1. Click on **TRACK CHANGES** and then **HIGHLIGHT CHANGES** in the **CHANGES** group on the **REVIEW** ribbon
2. The **HIGHLIGHT CHANGES** dialog will appear.
3. Tick the **TRACK CHANGES WHILE EDITING** option
4. Click on **OK**.
5. Any changes made to the workbook by anyone now will leave a mark in the cell to show it has been changed by who, when and what the change is.





To Accept/reject changes

When changes have been made to your workbook you may wish to check those changes and see what has been altered. You may not be happy with some of the changes and wish to reject them for what was previously within a cell.



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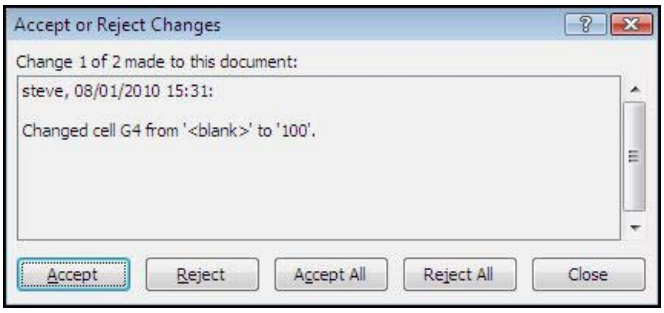
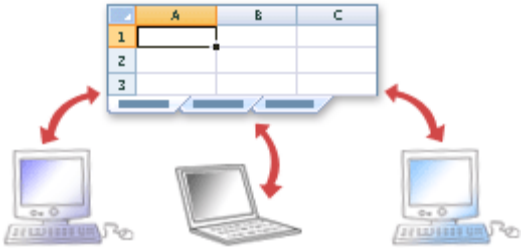
Mouse

1. Click on **TRACK CHANGES** and then **ACCEPT/REJECT CHANGES** in the **CHANGES** group on the **REVIEW** ribbon.
2. The **SELECT CHANGES TO ACCEPT OR REJECT** dialog will appear.
3. Click **OK.** The **ACCEPT OR REJECT CHANGES** dialog will appear



As you accept or reject each change the dialog will automatically move on to the next change. When you have finished click close to close the dialog and finish reviewing.

Use A Shared Workbook To Collaborate



You can create a shared workbook and place it on a network location where several people can edit the contents simultaneously. For example, if the people in your work group each handle several projects and need to know the status of each other's projects, the group can use a shared workbook to track the status of the projects. All persons involved can then enter the information for their projects in the same workbook.

As the owner of the shared workbook, you can manage it by removing users from the shared workbook and resolving conflicting changes. When all changes have been incorporated, you can stop sharing the workbook.

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Features that are not supported in a shared workbook

In a shared workbook, you cannot	But you may be able to do the following
Create an Excel table	None
Insert or delete blocks of cells	You can insert entire rows and columns.
Delete worksheets	None
Merge cells or split merged cells	None
Add or change conditional formats	Existing conditional formats continue to appear as cell values change, but you can't change these formats or redefine the conditions.
Add or change data validation	Cells continue to be validated when you type new values, but you can't change existing data validation settings.
Create or change charts or PivotChart reports	You can view existing charts and reports.
Insert or change pictures or other objects	You can view existing pictures and objects.
Insert or change hyperlinks	Existing hyperlinks continue to work.
Use drawing tools	You can view existing drawings and graphics.
Assign, change, or remove passwords	Existing passwords remain in effect.
Protect or unprotect worksheets or the workbook	Existing protection remains in effect.
Create, change, or view scenarios	None
Group or outline data	You can continue to use existing outlines.
Insert automatic subtotals	You can view existing subtotals.
Create data tables	You can view existing data tables.
Create or change PivotTable reports	You can view existing reports.
Write, record, change, view, or assign macros	You can run existing macros that don't access unavailable features. You can record shared workbook operations into a macro stored in another unshared workbook.
Add or change Microsoft Excel 4 dialog sheets	None
Change or delete array formulas	Existing array formulas continue to calculate correctly.
Use a data form to add new data	You can use a data form to find a record.

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Work with XML data, including: • Import, refresh, and export XML data • Add, rename, or delete XML maps • Map cells to XML elements • Use the XML Source task pane, XML toolbar, or XML commands on the Data menu	None

Share A Workbook

Create a new workbook and enter any data that you want to provide, or open an existing workbook that you want to make available for multi-user editing.

Not all features are supported in a shared workbook. If you want to include any of the following features, you should add them before you save the workbook as a shared workbook: merged conditional formatsdata validation, charts, pictures, objects including drawing objects, hyperlinksscenarios, outlinessubtotals, data tablesPivotTable reportsworkbook and worksheet protection, and macros. You cannot make changes to these features after you share the workbook.

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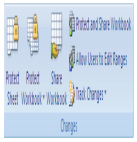
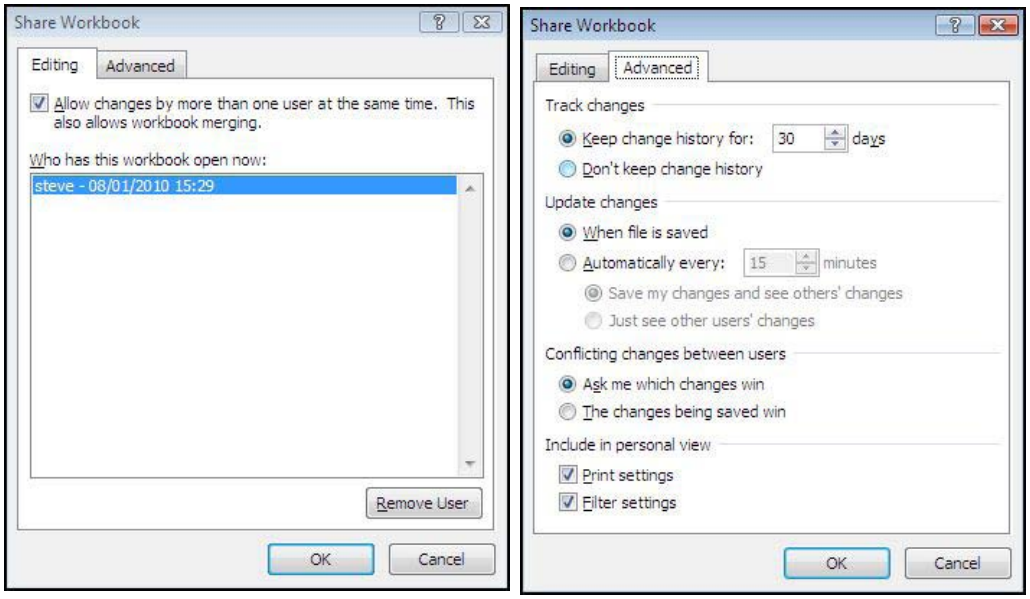
To share a workbook

Mouse



1. On the **REVIEW** tab, in the **CHANGES** group, click **SHARE WORKBOOK**.
2. On the **EDITING** tab, select the **ALLOW CHANGES BY MORE THAN ONE USER AT THE SAME TIME. THIS ALSO ALLOWS WORKBOOK MERGING** check box.
3. On the **ADVANCED** tab, select the options that you want to use for tracking and updating changes, and then click **OK**.



4. If this is a new workbook, type a name in the **FILE NAME** box.

OR

1. If this is an existing workbook, click **OK** to save the workbook, click **FILE RIBBON** and then click **SAVE AS**.
2. In the **SAVE IN** box, select a network location that is accessible to the intended users, and then click **SAVE**.

- *You should use a shared network folder, not a Web server.*

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3. If the workbook contains links to other workbooks or documents, verify the links and update any links that are broken, and then click **SAVE** on the **QUICK ACCESS TOOLBAR**, or press **CTRL+S**.

Links

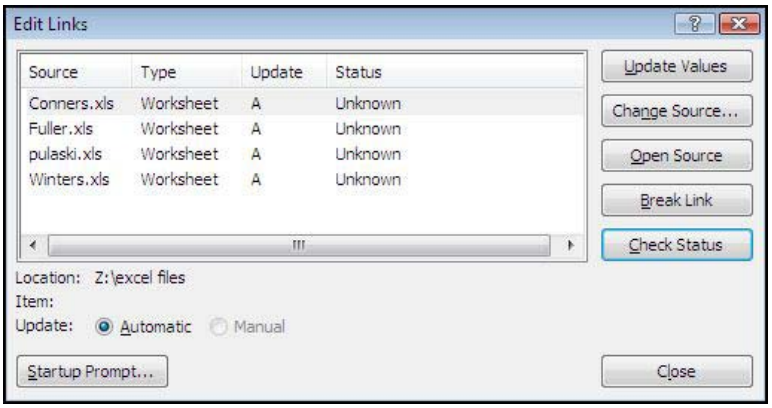
Links to data in other workbooks can be problematic if your are emailing a linked workbook or if linked files are in inaccessible areas of the network. Checking and editing links between the various files you are accessing especially if they are to be shared files is important.

To verify and update links to other workbooks or documents

Mouse

1. On the **DATA** tab, in the **CONNECTIONS** group, click **EDIT LINKS.**

- *The Edit Links to Files command is unavailable if your file does not contain linked information.*



2. Click **CHECK STATUS** to verify the status for all links in the list.

- *This may take a while if there are many links, or if the source workbook for the links is on a network location, and the network is slow.*

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3. Check the status in the **STATUS** column, click the link and then take the action that is needed.

IF THE STATUS IS	TAKE THIS ACTION
OK	No action is required. The link is working and up to date.
Unknown	Click **Check Status** to update the status for all links in the list.
N/A	The link uses Object Linking and Embedding (OLE) or Dynamic Data Exchange (DDE) Microsoft Office Excel cannot check the status of these types of links.
Error: Source not found	Click **Change Source**, and then select another workbook.
Error: Worksheet not found	Click **Change Source**, and then select another worksheet. The source may have been moved or renamed.
Warning: Values not updated	Click **Update Values**. The link was not updated when the workbook was opened.
Warning: Click Open Source, and calculate the workbook by pressing F9	The workbook may be set to manual calculation. To set the workbook to automatic calculation, click **File Ribbon**, and then click **Excel Options**. In the **Formulas** category, under **Calculation options**, click **Automatically**.
Warning: Some names cannot be resolved until the source workbook is opened	Click **Open Source**, switch back to the destination workbook and then click **CheckStatus**. If this does not resolve the problem, make sure that the name is not misspelled or missing. Switch to the source workbook, and then on the **Formulas** tab, in the **Named Cells** group, click **Name Manager**, and look for the name.
Warning: Click Open Source	The link cannot be updated until the source is open.
Source is open	The status of a link cannot be checked.
Values updated from *file name*	No action is required. The values have been updated.
Warning: Excel cannot determine the status of the link	The source may contain no worksheets or may be saved in an unsupported file format. Click **Update Values**.

Working With A Shared Workbook

All users with access to the network share have full access to the shared workbook unless you lock cells and protect the worksheet to restrict access. When you protect a shared workbook, you can set a password that all users must enter to open the workbook.

To edit the shared workbook, all users must have one of the following installed on their computers: Microsoft Office Excel, Microsoft Excel 97 or later or Microsoft Excel 98 or later for Macintosh.

Not all Excel features are supported in a shared workbook.

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To Edit a shared workbook

After you open a shared workbook, you can enter and change data as you do in a regular workbook.

1. Open the shared workbook.
2. Click the **FILE RIBBON** , and then click **EXCEL OPTIONS**.
3. In the **POPULAR** category, under **PERSONALIZE YOUR COPY OF OFFICE**, in the **USER NAME** box, enter the user name that you want to use to identify your work in the shared workbook, and then click **OK**.
4. Enter and edit data on the worksheets as usual.

- *You won't be able to add or change the following: merged cells, conditional formats, data validation, charts, pictures, objects including drawing objects, hyperlinks, scenarios, outlines, subtotals, data tables, PivotTable reports, workbook and worksheet protection, and macros.*
- *Make any filterand print settings that you want for your personal use. Each user's settings are saved individually by default.*
- *You can also use the filter or print settings that were made by the owner of the workbook whenever you open the workbook.*

5. To save your changes to the workbook and see the changes that other users have saved since your last save, click **SAVE** on the **QUICK ACCESS TOOLBAR**, or press **CTRL+S.**If the **RESOLVE CONFLICTS** dialog box appears, resolve the conflicts.

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- *You can see who else has the workbook open on the Editing tab of the Share Workbook dialog box (Review tab, Changes group, Share Workbook button).*
- *You can choose to get automatic updates of the other users' changes periodically, with or without saving, under Update changes on the Advanced tab of the Shared Workbook dialog box.*

To Remove a user from a shared workbook

If needed, you can disconnect users from a shared workbook.

- *Before disconnecting users, make sure that they have completed their work on the workbook. If you remove an active user, any unsaved work will be lost.*

Mouse

1. On the **REVIEW** tab, in the **CHANGES** group, click **SHARE WORKBOOK**.
2. On the **EDITING** tab, in the **WHO HAS THIS WORKBOOK OPEN NOW** list, review the names of users.
3. Select the name of the user who you want to disconnect, and then click **REMOVE USER**.

Although this action disconnects the user from the shared workbook, it does not prevent that user from editing the shared workbook again.

To delete any personal view settings of the removed user, do the following:

Mouse

1. On the **VIEW** tab, in the **WORKBOOK VIEWS** group, click **CUSTOM VIEWS**.
2. In the **VIEWS** list, select the view of another user, and then click **DELETE**.

Conflicts

A conflict happens when two users are both editing the same shared workbook and try to save changes that affect the same cell. Excel can keep only one of the changes in that cell. When saving the workbook Excel displays the **Resolve Conflicts** dialog box.

Resolve conflicting changes in a shared workbook

Mouse

1. In the **RESOLVE CONFLICTS** dialog box, read the information about each change and the conflicting changes made by the other user.

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2. To keep your change or the other person's change and to advance to the next conflicting change, click **ACCEPT MINE** or **ACCEPT OTHER**. To keep all of your remaining changes or all of the other user's changes, click **ACCEPT ALL MINE** or **ACCEPT ALL OTHERS**.

To override resolve conflicts dialog

To have your changes override all other changes without displaying the **RESOLVE CONFLICTS** dialog box again,:

Mouse

1. On the **REVIEW** tab, in the **CHANGES** group, click **SHARE WORKBOOK**.
2. On the **ADVANCED** tab, under **CONFLICTING CHANGES BETWEEN USERS**, click **THE CHANGES BEING SAVED WIN**, and then click **OK**.

To view how you or others resolved past conflicts

1. On the **REVIEW** tab, in the **CHANGES** group, click **TRACK CHANGES**, and then click **HIGHLIGHT CHANGES**.
2. In the **WHEN** list, select **ALL**. Clear the **WHO** and **WHERE** check boxes.
3. Select the **LIST CHANGES ON A NEW SHEET** check box, and then click **OK**.
4. On the History worksheet, scroll to the right to view the **ACTION TYPE** and **LOSING ACTION** columns.

	A	B	C	D	E	F	G	H	I	J	K
1	Action Number	Date	Time	Who	Change	Sheet	Range	New Value	Old Value	Action Type	Losing Action
2	1	08/01/2010	15:31	steve	Cell Change	All Divs	G4	100	<blank>		
3	2	08/01/2010	15:31	steve	Cell Change	All Divs	G14	bonus	<blank>		

Conflicting changes that were kept have Won for Action Type. The row numbers in the Losing Action column identify the rows with information about the conflicting changes that were not kept, including any deleted data. History worksheet is A separate worksheet that lists changes being tracked in a shared workbook, including the name of the person who made the change, when and where it was made, what data was deleted or replaced, and how conflicts were resolved.)

5. To save a copy of the workbook with all your changes, click **CANCEl** in the **RESOLVE CONFLICTS** dialog box, click **FILE** Ribbon, click **SAVE AS,** and then type a new name for the file.

To Stop sharing a workbook

Before you stop sharing the workbook, make sure that all other users have completed their work. Any unsaved changes will be lost. Because the change historywill also be deleted, you may want to start by printing the History worksheet or by copying it to another workbook.

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To keep a copy of the change history information.

1. On the **REVIEW** tab, in the **CHANGES** group, click **TRACK CHANGES,** and then click **HIGHLIGHT CHANGES.**
2. In the **WHEN** list, select **ALL**.
3. Clear the **WHO** and **WHERE** check boxes.
4. Select the **LIST CHANGES ON A NEW SHEET** check box, and then click **OK**.

- *To print the History worksheet, click **FILE RIBBON** , and then click **PRINT**.*
- *To copy the history to another workbook, select the cells that you want to copy, click **COPY** on the **HOME**ribbon in the **CLIPBOARD** group, switch to another workbook, click where you want to place the copied data, and then click **PASTE** on the **HOME** tab in the **CLIPBOARD** group.*

You may also want to save or print the current version of the workbook, because this history data might not apply to later versions of the workbook.

Stop Sharing

At some point you may wish to make your workbook exclusive again and stop sharing with other users for whatever reason. Maybe to enable you to use some of the features that are not available when shared.

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To stop sharing a workbook

Mouse

1. Click **OK** to close the **SHARE WORKBOOK** dialog box.
2. In the shared workbook,On the **REVIEW** tab, in the **CHANGES** group, click **UNPROTECT SHARED WORKBOOK**. A dialog will appear.
3. On the **EDITING** tab, make sure that you are the only person listed in the **WHO HAS THIS WORKBOOK OPEN NOW** list.
4. Clear the,**ALLOW CHANGES BY MORE THAN ONE USER AT THE SAME TIME. THIS ALSO ALLOWS WORKBOOK MERGING** check box.
5. When you are prompted about the effects on other users, click**Yes**

If this check box is not available, you must first unprotect the workbook. To remove shared workbook protection,

6. If you are prompted, enter the password
7. Then click **OK**.

A way to restrict access to a workbook, worksheet or part of a worksheet. Excel passwords can be up to 255 letters, numbers, spaces and symbols. You must type uppercase and lowercase letters correctly when you set and enter passwords.)

Auditing

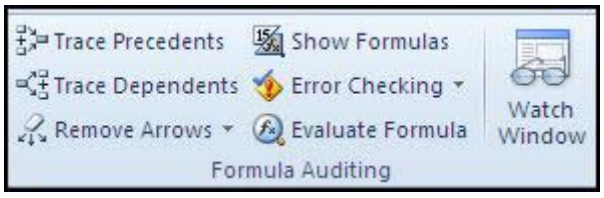
Tool Information

Tracers

The precedent, dependent and error tracers display arrows on the worksheet to represent the flow of computations: The can be found The **FORMULA AUDITING** group and on the **FORMULAS** ribbon.

Tracer Type	Arrow type
Formula	Solid blue
Error	Solid red
External reference or reference to other work-sheet	Dashed black with an icon

PRECEDENTS AND DEPENDANTS



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Precedents are cells referred to by other formulae. Dependants are cells containing formulae that refer to other cells.

You use the formula Auditing group on theformulas ribbon to set auditing options.

COMMENTS

Comments are text or audio messages attached to cells usually giving a more detailed explanation of a cells content.

ERROR CHECKING

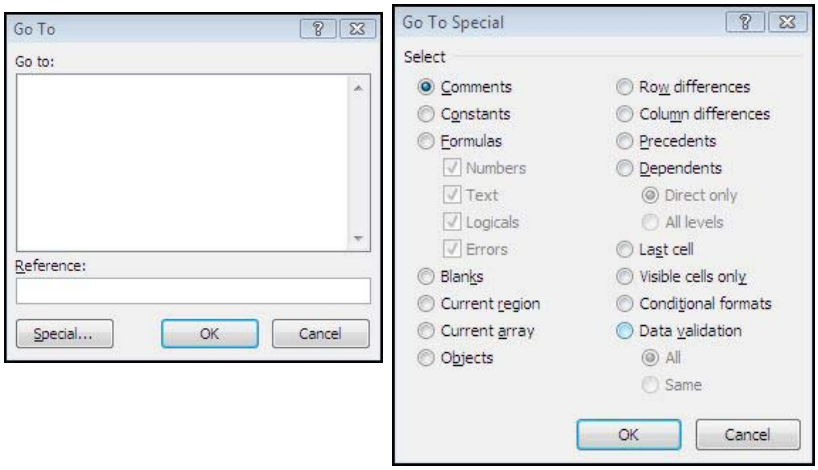
Check for errors in calculations throughout your workbook.

Go To Special

A method of selecting cells with particular contents or properties.

To use go to special

Mouse



1. Press **F5** key
2. Click on **SPECIAL** button
3. Make a selection
4. Click **OK**

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Error Checking

To check for errors

1. Select the worksheet that you want to check for errors. If the worksheet is manually calculated, press **F9** to recalculate now.
2. On the **FORMULAS**ribbon, in the **FORMULA AUDITING** group, click the **ERROR CHECKING** button.

- *The Error Checking dialog box is displayed when errors are found.*

3. Position the **ERROR CHECKING** dialog box just below the formula bar
4. Click one of the action buttons in the right side of the dialog box. The available actions differ for each type of error.

- *If you click Ignore Error, the error is marked to be ignored for each consecutive check.*

5. Click **NEXT**. Continue until the error check is complete.

To reset ignored errors

If you have previously ignored any errors, you can check for those errors again by doing the following:

1. Click **OPTIONS**.
2. In the **ERROR CHECKING** section, click **RESET IGNORED ERRORS**.
3. Click **OK**then Click **RESUME**.

- *Resetting ignored errors resets all errors in all sheets in the active workbook.*

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Correct An Error Value Manually

If a formula cannot correctly evaluate a result, Excel displays an error value, such as #####, #DIV/0!, #N/A, #NAME?, #NULL!, #NUM!, #REF!, and #VALUE!. Each error type has different causes, and different solutions.

The following table contains links to articles that describe these errors in detail, and a brief description to get you started.

Error value	Description
#####	Excel displays this error when a column is not wide enough to display all the characters in a cell, or a cell contains negative date or time values.
#DIV/0!	Excel displays this error when a number is divided either by zero (0) or by a cell that contains no value.
#N/A	Excel displays this error when a value is not available to a function or formula.
#NAME?	This error is displayed when Excel does not recognize text in a formula.
#NULL!	Excel displays this error when you specify an intersection of two areas that do not intersect (cross). The intersection operator is a space character that separates references in a formula.
#NUM!	Excel displays this error when a formula or function contains invalid numeric values.
#REF!	Excel displays this error when a cell reference is not valid.
#VALUE!	Excel can display this error if your formula includes cells that contain different data types.

Watch Window

Is a useful tool which allows you to watch the values of calculated cells on other sheets while you change values that they are dependent on, on a completely different sheet.

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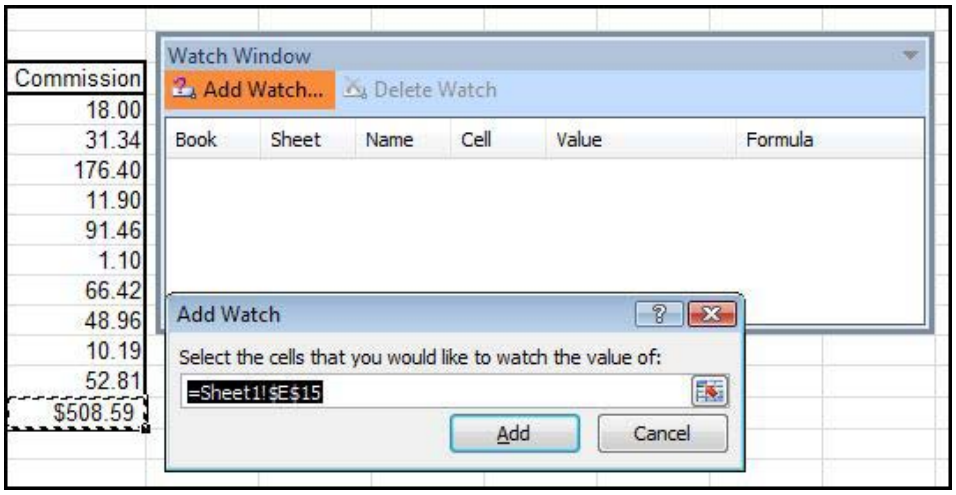
To set a watch

Mouse

1. Select a cell to which you want to add a Watch
2. Go to the **FORMULAS** ribbon an click on **WATCH WINDOW** in the **FORMULA AUDITING** group
3. Click on **ADD WATCH**
4. Select cell you wish to monitor



5. Click on **ADD**
6. You may now switch windows orscroll and the watch window will monitor that cell for changes in result as you enter or manipulate figures elsewhere.

To delete a watch

Mouse

1. Go to the **FORMULAS** ribbon an click on **WATCH WINDOW** in the **FORMULA AUDITING** group
2. Select watch to delete
3. Click on **DELETE WATCH** on watch window

Dependants And Precedents

A direct precedent is a cell referred to by the formula in the active cell. An indirect precedent is a cell referred to by a formula in a direct precedent cell or another indirect precedent cell.

A direct dependant is a cell containing a formula that refers to the active cell. An indirect dependent is a cell that contains a formula that refers to a direct dependant cell or another indirect dependant cell.

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To audit for direct and indirect precedents:

Mouse

1. Click on the cell you want to audit.
2. Click the trace precedents button on the Auditing toolbar.

To audit for direct and indirect dependants:

Mouse

1. Click on the cell you want to audit.
2. Click the trace dependant's button on the Auditing toolbar.

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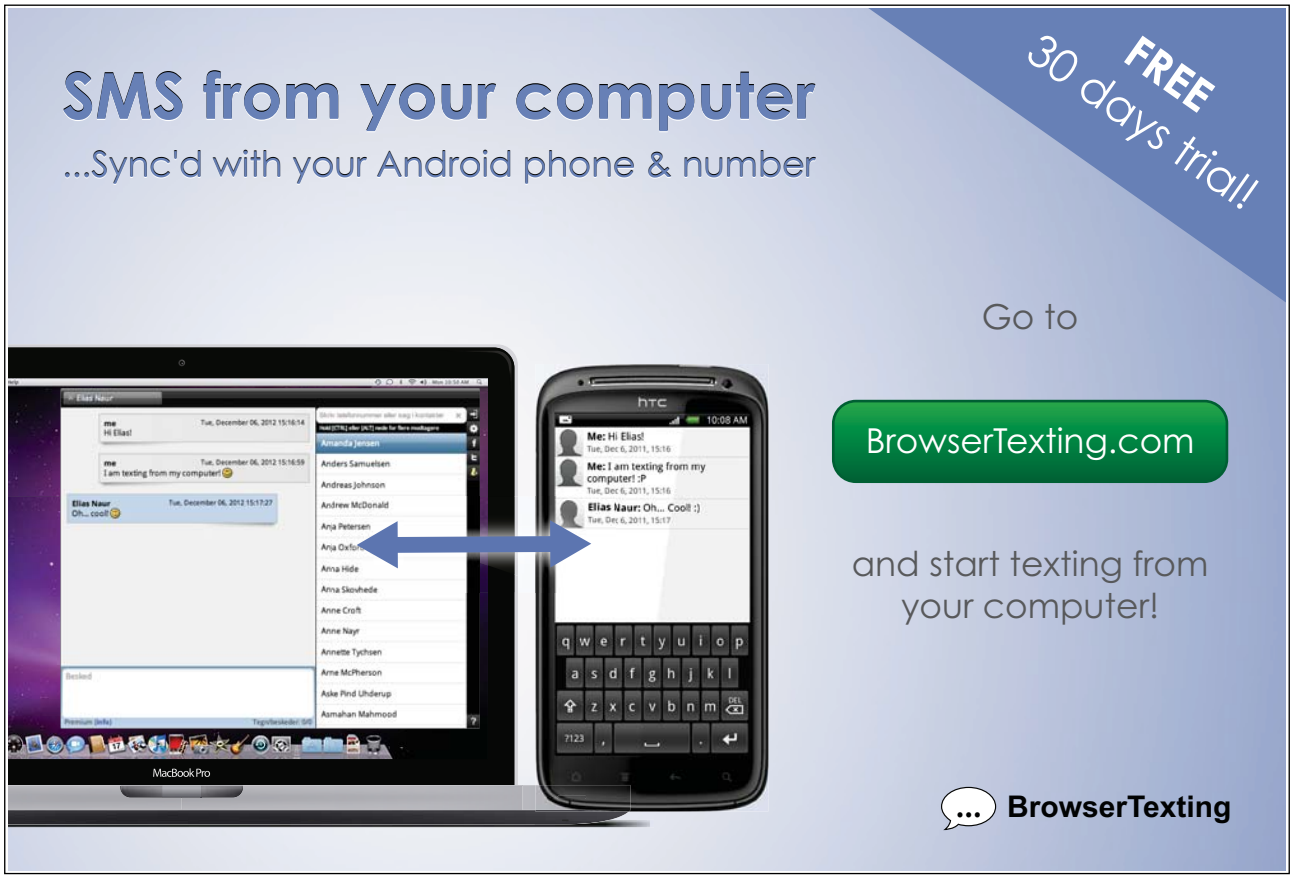

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Click either button a second time to view indirect precedents or dependants of the active cell.

To remove the tracer arrows:

Mouse

1. Click the **REMOVE PRECEDENTARROWS** to remove precedent tracers or **REMOVE DEPENDANT ARROWS** to remove dependant tracers.

Or

1. Click the **REMOVE ARROWS** button to remove both precedent and dependant tracers.

Proofing Tools

Spelling And Grammar

As a deadline approaches, often there is not enough time to check a document for spelling and grammar mistakes. Your Microsoft Office program provides tools that can help you correct these mistakes faster. You decide if you want to set up the Microsoft Office program so that you can easily see potential mistakes while you work. Or, if you find the wavy red and green lines distracting, you can just check your document when you are ready to finish it.

Maybe you are looking for a way to find and fix spelling mistakes in your document more quickly and easily? Or maybe you don't want to see the wavy red lines that your Microsoft Office program displays in your document? This section explains how automatic spelling and grammar checking works and how to turn it on or off.

- *There is no option to **CHECK SPELLING WHILE YOU TYPE** in Microsoft Office Access, Microsoft Office Excel or Microsoft Office Project.*
- *Grammar checking is available only in Microsoft Office Outlook and Microsoft Office Word.*

To check spelling

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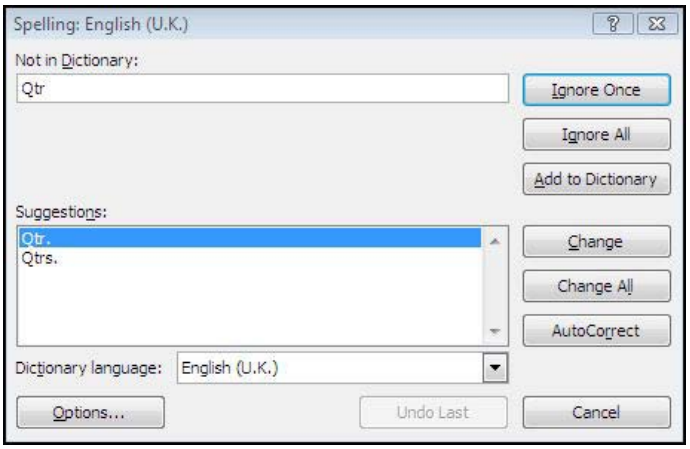
Mouse

1. Click inside a worksheet that you are editing to check the entire active worksheet, including cell values, cell comments, embedded charts, text boxes, buttons, headers, and footers.
- *Excel does not check protected worksheets, formulas or text that results from a formula. Also, if the formula bar is active when you check spelling, Excel checks only the contents of the formula bar.*
2. Optionally, to check only a specific piece of text, select the text you want to check.
3. Click on **SPELLCHECKER** in the **PROOFING** group on the **REVIEW** ribbon.



4. If the program finds spelling mistakes, a dialog box or task pane is displayed, and the first misspelled word found by the spelling checker is selected. You decide how you want to resolve each error that the program finds.
5. After you resolve each misspelled word, the program flags the next misspelled word, so that you can decide what you want to do.
6. When all spelling has been corrected a dialog appears telling you that the spell check is complete

Thesaurus

To use thesaurus

Mouse

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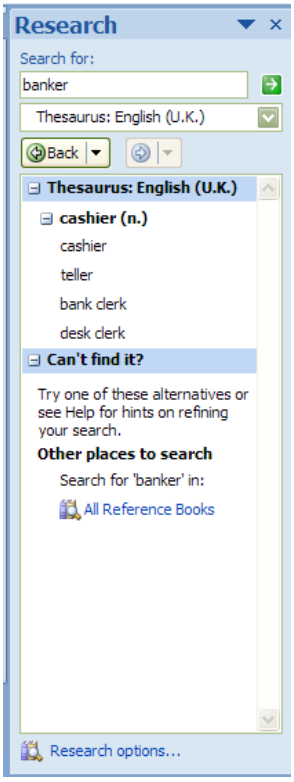

1. On the **REVIEW** tab, in the **PROOFING** group click **THESAURUS**.
2. Press **ALT** and click the word that you want to look up. Results appear in the **RESEARCH** task pane.

You can type a word or phrase in the* Search for *box, and then click Start Searching .

3. To use one of the words in the list of results or to search for more words, do one of the following:
4. To use one of the words, point to it, click the down arrow and then click **INSERT** or **COPY**.
5. To look up additional related words, click a word in the list of results.

You can also look up words in the thesaurus of another language. If, for example, your document is in French and you want synonyms, click* Research options *in the* Research *task pane, and then under* Reference Books*, select the thesaurus options that you want.

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Translation

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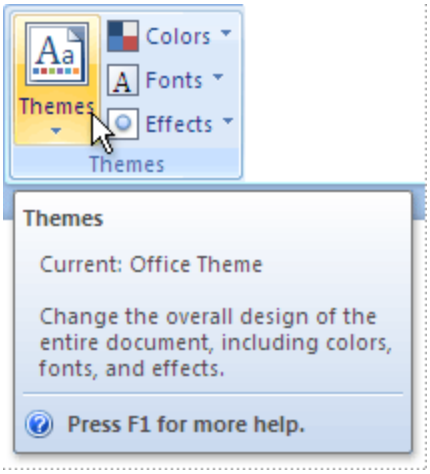
Using the Research feature, you can translate single words or short phrases by using bilingual dictionaries or translate your entire document by using Web-based machine translation services. To translate text, you may also need to satisfy the operating system requirements for specific languages.

1. On the **REVIEW** tab, in the **LANGUAGE** group click **TRANSLATE**.
2. The translation service appears in the **RESEARCH** task pane.
3. To change the languages that are used for translation, in the **RESEARCH** task pane, under **TRANSLATION**, select the languages that you want to translate from and to. For example, to translate English to French, click **ENGLISH (U.S.)** in the **FROM** list and **FRENCH (FRANCE)** in the **TO** list.
4. To translate a specific word, press **ALT** and click a word. The results appear in the **RESEARCH** task pane under **TRANSLATION**.

5. To translate a short phrase, select the words, press **ALT** and click the selection. The results appear in the **RESEARCH** task pane under **TRANSLATIOn**.

You can type a word or phrase in the* SEARCH FOR *box, and then click Start Searching

Show Or Hide Screentips



ScreenTips are small windows that display descriptive text when you rest the pointer on a command or control.

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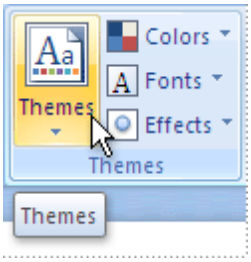

Enhanced ScreenTips are larger windows that display more descriptive text than a ScreenTip and can have a link to a Help topic. Enhanced ScreenTips are available in the following 2010 Microsoft Office system programs: Access, Excel, PowerPoint and Word.

To set screentip options

Mouse

1. Click the **FILE RIBBON** , and then click **OPTIONS**.
2. Make sure the **GENERAL** Tab is selected
3. Under **USER INTERFACE OPTIONS**, in the **SCREENTIP STYLE** list, click the option that you want:

- ***SHOW FEATURE DESCRIPTIONS IN SCREENTIPS*** *This option turns on ScreenTips and Enhanced ScreenTips. This is the default setting.*
- ***DON'T SHOW FEATURE DESCRIPTIONS IN SCREENTIPS*** *This option turns off Enhanced ScreenTips. You still see ScreenTips.*
- ***DON'T SHOW SCREENTIPS*** *This option turns off ScreenTips and Enhanced ScreenTips.*

Prepared by Stephen Moffat on the 9thJanuary2010